P.P.2465
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~~456.b.20~~

The LADIES' *Diary*:
OR
WOMAN'S ALMANACK,

For the Year of our LORD 1784;
Being the BISSEXTILE, or LEAP-YEAR.
Containing New Improvements in ARTS and SCIENCES,
And many Entertaining PARTICULARS:
Deſigned for the *Uſe* and *Diverſion* of the
FAIR-SEX.

The Eighty-firſt ALMANACK Publiſhed of this Kind

VIRTUE and SENSE, with FEMALE-SOFTNESS join'd,
(ALL that ſubdues and captivates Mankind!)
In BRITAIN's Matchleſs FAIR reſplendent ſhine;
THEY rule LOVE's Empire by a Right Divine:
Juſtly their Charms the aſtoniſh'd World admires,
Whom *Royal* CHARLOTTE's bright Example fires.

LONDON:
Printed for the COMPANY of STATIONERS,
And ſold by JOHN WILKIE, at their Hall in Ludgate-Street.

[Price, ſtitched, NINE PENCE.]

Ephemerides. k.

Y. of Chriſt.		Ys. ſince.
1600	King Charles I. born - -	184
1603	Q. Eliz. died, K. Ja. ſucc.	181
1603	A great Plague in London	181
1605	Popiſh Gun-powder Plot -	179
1616	Shakſpeare the poet died	168
1625	K. James died, Cha. I. ſucc.	159
1641	Bloody Iriſh maſſacre -	143
1642	Sir I. Newton born, Dec. 25	142
1649	K. Charles I. beheaded -	135
1658	Oliver Cromwell died -	126
1660	K. Charles II. reſtored -	124
1662	Royal Society inſtituted	122
1665	Died of the plague 68,586	119
1666	Great fire in London -	118
1666	War againſt Denmark decl.	118
1667	Peace with Hol. Fr. & Denm.	117
1672	War againſt Holland decl.	112
1672	Halfpence & Farth. coined	112
1674	Peace with Holland procl.	110
1679	Habeas Corpus act paſſed	105
1685	K. Cha. II. died, Ja. II. ſucc.	99
1688	Prince of Orange landed -	96
1688	K. James II. abdicated -	96
1689	Wm. and Mary crowned	95
1693	Hackney coaches eſtabliſhed	91
1702	K. Wm. died, Q. Ann ſucc.	82
1702	War againſt France declared	82
1707	England & Scotland united	77
1713	Peace with France procl. -	71

Y. of Chriſt.		Ys. ſinc
1714	Q. Ann died, K. Geo. I. ſucc.	70
1715	Rebellion in the north -	69
1716	A very great froſt - - -	68
1726	Sir Iſaac Newton died -	58
1727	K. Geo. I died, Geo. II. ſucc.	57
1739	War againſt Spain declared	45
1739	A very great froſt - - -	45
1743	A great comet appeared -	41
1744	War againſt France declared	40
1745	Rebellion in Scotland - -	3
1748	A general peace - - -	3
1750	Weſtminſter bridge finiſhed	3
1752	Date and Calendar altered	3
1756	War againſt France declared	2
1760	K. Geo. II. died, G. III. ſucc.	2
1762	American philoſ. ſoc. inſtit.	2
1762	War againſt Spain declared	2
1763	Peace with France & Spain	2
1765	Otaheite diſcovered - -	1
1770	Blackfriars bridge finiſhed	1
1772	A revolution in Denmark -	1
1772	A revolution in Sweden -	1
1775	War againſt America begun	
1776	America declared independent	
1778	French treaty with America	
1778	War againſt Fr. commenced	
1779	War againſt Spain begun -	
1780	War againſt Holland begun	
1783	A general Peace - -	

BIRTH-DAYS, [N. S.] and YEARS, of the ROYAL FAMIL of GREAT BRITAIN.

KING GEORGE III. June 4,	1738
Prince of Wales, Auguſt 12, -	1762
Prince Frederick, Auguſt 16,	1763
Prince William Henry, Aug. 21,	1765
Prs. Charl. Aug. Mat. Sept. 29,	1766
Prince Edward, Nov. 2, - -	1767
Prs. Auguſta Sophia, Nov. 8, -	1768
Prs. Elizabeth, May 22, - -	1770
Prince Erneſt Auguſtus, June 5,	1771
Prince Aug. Fred. Jan. 27, -	1773

Prince Adolph. Fred. Feb. 24,	177
Princeſs Mary, April 25, - -	177
Princeſs Sophia, Nov. 3, - -	177
Princeſs Amelia, Aug. 7, -	178
Queen Charlotte, May 19, - -	174
Prs. Amelia, June 10, - -	171
Prs. Auguſta of Brunſw. Aug. 11,	173
Duke of Glouceſter, Nov. 25,	174
Duke of Cumberland, Nov. 7,	174

YEARS of BIRTHS of the Principal SOVEREIGN PRINCES of EUROPE.

Cha. Frederick, King of Pruſſia,	1712
Achmet IV. Grand Seignor -	1715
Charles, King of Spain, - -	1716
Pius VI. Pope - - - -	1717
Victor Amada Maria, K. Sardinia	1726
Catherine, Empreſs of Ruſſia,	1729
Staniſlaus Aug. King of Poland	1732

Maria, Queen of Portugal - -	173
Joſeph Ben. Aug. Emp. Germ.	174
Guſtavus, King of Sweden, -	174
William V. Stadtholder, - -	174
Chriſtian VII. K. of Denmark,	174
Ferdinand IV. King of Sicily,	175
Lewis XVI. King of France, -	175

Nº 81. January hath xxxi Days.

Full Moon, 7th, 52 m. paſt 1 aftern.
Laſt Quarter, 15th, 34 m. paſt 4 aftern.
New Moon, 22d, 48 m. paſt 9 morn.
Firſt Quarter, 29th, 49 m. paſt 5 morn.

Sun enters ♒
19d. 19h. 36m.

1	TH	Circumciſion	8	5	3	55	23s	2	2 m	3	9
2	F			4		56	22	56	3	20	10
3	S			4		56		51	4	38	11
4	D	2 Sunday after Chriſtmas		3		57		45	5	51	12
5	M	Old Chriſtmas-day		2		58		38	6	57	13
6	Tu	Epiphany		1		59		31	7	51	14
7	W			0	4	0		24	☾ riſes		F
8	TH	*Lucian*		0		0		16	4 a	46	16
9	F		7	59		1		7	6	0	17
10	S			58		2	21	59	7	11	18
11	D	1 Sunday after Epiphany		57		3		49	8	22	19
12	M	*PlowMon.* Old N. Y. Day		56		4		40	9	28	20
13	Tu	*Hilary.* Cam. Ter. beg.		54		6		30	10	46	21
14	W	Oxf. Term begins		53		7		19	morn		22
15	TH			52		8		8	0	0	23
16	F			51		9	20	57	1	18	24
17	S			50		10		46	2	39	25
18	D	2 Sun. aft. Epiph. *Priſca*		48		12		33	4	8	26
19	M	Queen's Birth-day kept		47		13		21	5	33	27
20	Tu	*Fabian.* Hilary 1 Ret.		46		14		8	6	44	28
21	W	*Agnes*		44		16	19	55	7	38	29
22	TH	*Vincent*		43		17		41	☾ ſets		N
23	F	Hilary Term begins		41		19		27	5 a	54	2
24	S			40		20		13	7	26	3
25	D	3S. aft. Ep. Conv. St. Paul		38		22	18	58	8	52	4
26	M			37		23		43	10	12	5
27	Tu	Pr. Aug. F. b. 1773. Hil. 2R.		35		25		28	11	35	6
28	W			34		26		12	morn		7
29	TH			32		28	17	56	0	58	8
30	F	K. Cha. I. mart.		31		29		40	2	17	9
31	S			29		31		23	3	32	10

Days	L. of D.		Day Inc.		D. breaks		Tw. ends		Sun Eaſt		Cl. bef. S.		7 Stars So.	
1	7	50	0	6	6	0	6	0	4	41	4′	1″	8 af	45
6		58		14	5	58		2		43	6	18		23
11	8	6		22		54		6		46	8	23		1
16		18		34		49		11		49	10	13	7	40
21		32		48		44		16		53	11	47		19
26		46	1	2		38		22		58	13	1	6	57

February hath xxix Days. 1784.

Full Moon, 6th, 19 m. paſt 9 morn.
Laſt Quarter, 14th, 19 m. paſt 5 morn.
New Moon, 20th, 25 m. paſt 8 night.
Firſt Quarter, 27th, 44 m. paſt 10 night

Sun enters ♓
18 d. 10 h. 24 m.

M D	W D	Sundays, Holydays, &c	Sun riſes	Sun ſets	Sun's decl.	☾ riſes & ſets	☾'s Age
1	D	4 Sunday after Epiphany	7 27	4 33	17 s 7	4 m 41	11
2	M	Purif. or Candlemas	25	35	16 49	5 39	12
3	Tu	*Blaſe.* **Hilary, 3 Return**	24	36	32	6 22	13
4	W		22	38	14	6 53	14
5	Th	*Agatha*	20	40	15 56	7 16	15
6	F		19	41	38	☾ riſes	F
7	S		17	43	19	6 a 7	17
8	D	Septuageſima	15	45	0	7 18	18
9	M	**Hilary, 4 Return**	13	47	14 41	8 29	19
10	Tu		11	49	21	9 44	20
11	W		9	51	2	1 0	21
12	Th	Hilary Term ends	8	52	13 42	morn	22
13	F	**Old Candlemas-day**	6	54	22	0 20	23
14	S	*Valentine*	4	56	2	1 4[illegible]	24
15	D	Sexageſima	2	58	12 41	3 20	25
16	M		0	5 0	20	4 23	26
17	Tu		6 58	2	11 59	5 23	27
18	W		56	4	38	6 5	28
19	Th		54	6	17	6 35	29
20	F		52	8	10 56	☾ ſets	N
21	S		51	9	34	6 a 16	1
22	D	Quinquageſima	49	11	12	7 42	2
23	M		47	13	9 50	9 10	3
24	Tu	St.Mat.Pr.Ad.Fr.b.1774	45	15	28	10 29	4
25	W	Aſh-Wedneſ. [Shr.Tu	43	17	6	11 57	5
26	Th		41	19	8 44	morn	6
27	F		39	21	21	1 18	7
28	S		37	23	7 58	2 31	8
29	C	Quadr. or 1 S. in Lent.	35	25	36	3 34	9

Days	L. of D.	Day Inc	D. breaks	Tw. ends	Sun Eaſt	Cl. bef. S.	7 Stars So.
1	9 6	1 22	5 32	6 28	5 3	14′ 5″	6 at 34
6	22	38	24	36	9	32	13
11	42	58	16	44	14	40	5 53
16	10 0	2 16	7	53	20	29	34
21	18	34	4 58	7 2	26	1	15
26	38	54	49	11	32	13 17	4 56

March hath XXXI Days.

Full Moon, 7th, 35 m. paſt 3 morn.
Laſt Quarter, 14th, 40 m. paſt 2 aftern.
New Moon, 21ſt, 13 m. paſt 7 morn.
Firſt Quarter, 28th, 23 m. paſt 5 even.

Sun enters ♈
19 d. 10h. 46m.

1	M	*David*	6	33	5	27	7 s	13	4 m	24	10
2	Tu	*Chad*		31		29	6	50	4	56	11
3	W	Ember Week		29		31		27	5	25	12
4	Th			27		33		4	5	43	13
5	F			25		35	5	41	5	57	14
6	S			23		37		17	6	9	15
7	C	2 S. in Lent. *Perpetua*		21		39	4	54	☾ riſes		F
8	M			19		41		31	7 a	37	17
9	Tu			17		43		7	8	53	18
10	W			15		45	3	44	10	14	19
11	Th			13		47		20	11	34	20
12	F	*Gregory*		11		49	2	56	morn		21
13	S			9		51		33	0	59	22
14	C	3 Sunday in Lent		7		53		9	2	17	23
15	M			5		55	1	45	3	21	24
16	Tu			3		57		22	4	7	25
17	W	*St. Patrick*		1		59	0	58	4	41	26
18	Th	*Edw. K. W. S.*	5	59	6	1		34	5	3	27
19	F			57		3		11	5	20	28
20	S			55		5	0 n	13	5	40	29
21	C	4, or Midlent S. *Benedict*		53		7		37	☾ ſets		N
22	M			51		9	1	0	8 a	10	2
23	Tu			49		11		24	9	36	3
24	W			47		13		48	11	1	4
25	Th	Annunc. or Lady-Day		45		15	2	11	morn		5
26	F			43		17		35	0	20	6
27	S			41		19		58	1	28	7
28	C	5 Sunday in Lent		39		21	3	22	2	25	8
29	M			37		23		45	3	6	9
30	Tu			36		24	4	8	3	34	10
31	W			34		26		31	3	57	11

Days	L. of D.		Day Inc.		D. breaks		Tw. ends		Sun Eaſt		Cl. bef. S.		7 Stars	
1	10	54	3	10	4	42	7	18	5	37	12′	31″	4 af	41
6	11	14		30		31		29		43	11	22		23
11		34		50		20		40		49	10	3		5
16		54	4	10		10		50		56	8	38	3	46
21	12	14		30		0	8	0	6	2	7	7		28
26		34		50	3	48		12		8	5	35		10

April hath xxx Days.

Full Moon, 5th, 7 m. paſt 7 aftern.
Laſt Quarter, 12th, 32 m. paſt 9 night.
New Moon, 19th, 15 m. paſt 6 even.
Firſt Quarter, 27th, 27 m. paſt 12 noon.

Sun enters ♉
18 d. 23 h. 30 m.

1	Th		5 32	6 28	4 n 54	4 m 11	12
2	F	Camb. Term ends	30	30	5 17	4 24	13
3	S	Oxf. T. ends. *Richard*	28	32	40	4 41	14
4	C	6S.in Lent, or Palm-S. *St.*	26	34	6 3	4 52	15
5	M	Old Lady-Day [*Ambroſe*	24	36	26	☾ riſes	F
6	Tu		22	38	48	8 5	17
7	W		20	40	7 11	9 30	18
8	Th		18	42	33	10 53	19
9	F	Good-Friday	16	44	55	morn	20
10	S		14	46	8 17	0 14	21
11	C	Eaſter-Day	12	48	39	1 24	22
12	M	Eaſter-Monday	10	50	9 1	2 15	23
13	Tu	Eaſter-Tueſday	8	52	23	2 52	24
14	W		6	54	44	3 15	25
15	Th		5	55	10 6	3 35	26
16	F		3	57	27	3 51	27
17	S		1	59	48	4 7	28
18	C	Low-Sunday	4 59	7 1	11 9	4 20	29
19	M	*Alphege*	57	3	30	☾ ſets	N
20	Tu		55	5	50	8 a 39	1
21	W	Oxf. and Cam. T. begin	53	7	12 10	10 1	2
22	Th		51	9	30	11 16	3
23	F	St. George	50	10	50	morn	4
24	S		48	12	13 10	0 17	5
25	C	2S.af.Eaſt. St.Mark. Prs.	46	14	29	1 6	6
26	M	Eaſter, 1 Ret. [Mary Lo.	44	16	49	1 41	7
27	Tu		42	18	14 8	2 4	8
28	W	Eaſter Term begins	40	20	27	2 23	9
29	Th		39	21	45	2 37	10
30	F		37	23	15 3	2 50	11

Days	L. of D.	Day Inc.	D.breaks	Tw. ends	Sun Eaſt	Cl. bef. S.	7 Stars So.
1	12 50	5 12	3 31	8 31	6 16	3′ 43″	2 af 48
6	13 16	32	19	43	22	2 14	30
11	36	52	4	58	28	0 49	11
16	54	6 10	2 52	9 11	34	0 af 27	1 53
21	14 14	30	38	25	39	1 33	34
26	32	48	23	40	45	2 29	15

May hath xxxi Days.

Full Moon, 5th, 17 m. paſt 7 morn.
Laſt Quarter, 12th, 3 m. paſt 3 morn.
New Moon, 19th, 48 m. paſt 5 morn.
Firſt Quarter, 27th, 32 m. paſt 6 morn.

Sun enters ♊
20d. 0 h. 5 m.

1	S	St. Philip & St. James	4 35	7 25	15 n21	3 m 2	12
2	C	3 Sunday after Eaſter	34	26	39	3 13	13
3	M	*Invent. of the Croſs.* Eaſter,	32	28	57	3 22	14
4	Tu	[2 Ret.	30	30	16 14	3 33	15
5	W		28	32	31	☾ riſes	F
6	Th	*John Ev. a. P. L.*	27	33	48	10 a 3	17
7	F		25	35	17 4	11 17	18
8	S		23	37	20	morn	19
9	C	4 Sunday after Eaſter	22	38	36	0 5	20
10	M	Eaſter, 3 Return	20	40	52	0 58	21
11	Tu		19	41	18 7	1 24	22
12	W		17	43	22	1 43	23
13	Th		16	44	37	2 0	24
14	F		14	46	51	2 14	25
15	S		13	47	19 5	2 25	26
16	C	Rogation Sunday	11	49	19	2 36	27
17	M	Eaſter, 4 Return	10	50	32	2 50	28
18	Tu		8	52	45	3 9	29
19	W	Q. Charl. b. 1744. *Dunſtan.*	7	53	58	☾ ſets	N
20	Th	Aſcenſion, or Holy-Th.	6	54	20 11	10 a 7	2
21	F	Eaſter, 5 Return	4	56	23	11 1	3
22	S	Prs. Eliz. born, 1770	3	57	34	11 38	4
23	C	Sunday after Aſcenſion	2	58	46	morn	5
24	M	Eaſter Term ends	0	8 0	57	0 6	6
25	Tu		3 59	1	21 7	0 26	7
26	W	*Auguſtine A. B.*	58	2	18	0 42	8
27	Th	Oxf. T. ends. *Ven. Bede*	57	3	28	0 57	9
28	F		56	4	37	1 6	10
29	S	K. Ch. II. reſtored, 1660	55	5	46	1 15	11
30	C	Whit-Sunday	54	6	55	1 25	12
31	M	Whit-Monday	53	7	22 3	1 38	13

Days	L. of D.	Day Inc.	D. breaks	Tw. ends	Sun Eaſt	Cl. aft. S.	7 Stars So.
1	14 50	7 6	2 5	9 59	6 50	3′ 12″	0 af 56
6	15 6	22	1 51	10 13	56	42	37
11	22	38	29	35	7 0	58	18
16	38	54	6	59	5	59	11 m 58
21	52	8 8	0 30	11 36	9	45	39
26	16 4	20	No real Night.		12	18	10

June hath xxx Days.

Full Moon, 3d, 34 m. paſt 4 aftern.
Laſt Quarter, 10th, 28 m. paſt 8 morn.
New Moon, 17th, 26 m. paſt 6 even.
Firſt Quarter, 25th, 33 m. paſt 10 night.

Sun enters ♋
20d. 8h. 49m.

1	Tu	Whit-Tueſday. *Nicomede*	3 52	8 8	22n 11	1 m 52	14
2	W	Ember Week	51	9	19	2 14	15
3	Th		50	10	26	☾ riſes	F
4	F	K. Geo. III. born, 1738	49	11	33	10 a 3	17
5	S	Pr.Er.Aug.b.1771. *Bonif.*	49	11	40	10 49	18
6	C	Trinity Sunday	48	12	46	11 22	19
7	M	Trinity, 1 Return	47	13	51	11 46	20
8	Tu		47	13	57	morn	21
9	W	Oxf. T. begins [*Chriſti*	46	14	23 2	0 4	22
10	Th	Prs.Amel.b.1711. *Corpus*	46	14	6	0 18	23
11	F	St.Barnabas.Trin.T.beg.	45	15	10	0 29	24
12	S		45	15	14	0 41	25
13	C	1 Sunday after Trinity	44	16	17	0 55	26
14	M	Trinity, 2 Return	44	16	20	1 11	27
15	Tu		44	16	22	1 31	28
16	W		43	17	24	2 2	29
17	Th	*St. Alban*	Longeſt Day, at Lond. is 16h. 34m. 4 ſec.	allowing 9 m. 16 ſec. for refraction.	26	☾ ſets	N
18	F				27	9 a 34	1
19	S				28	10 4	2
20	C	2S.aft.Tr. *Tr.Edw.K.W.S.*			28	10 26	3
21	M	Longeſt Day. Trin. 3 Ret.			28	10 44	4
22	Tu				28	10 57	5
23	W				27	11 8	6
24	Th	Nativ. of St. John Baptiſt			25	11 19	7
25	F		43	17	24	11 28	8
26	S		44	16	22	11 38	9
27	C	3 Sunday after Trinity	44	16	19	11 52	10
28	M	Trinity, 4 Return	44	16	16	morn	11
29	Tu	St. Peter	45	15	13	0 9	12
30	W	Trinity Term ends	45	15	9	0 36	13

Days	L. of D.	Day Inc	D.breaks	Tw. ends	Sun Eaſt	Cl. aft. S	7 Stars So.
1	16 16	8 32			7 16	2′ 31″	10 m 54
6	24	40	No night, but conſtant day or twilight.		18	1 41	34
11	30	46			19	0 44	14
16	34	50			20	obe. 19	9 55
21	34	50			21	1 25	32
26	32	dec. 2			20	2 28	12

N° 81.

July hath xxxi Days.

Full Moon, 2d, 6 m. paſt 12 midn.
Laſt Quarter, 9th, 1 m. paſt 3 aftern.
New Moon, 17th, 36 m. paſt 8 morn.
Firſt Quarter, 25th, 2 m. paſt 12 noon.

Sun enters ♌
21 d. 19 h. 40 m.

1	Th		3	46	8	14	23 n	5	1 m 14	14
2	F	*Viſitation of the V. Mary*		46		14		0	2 12	15
3	S	Dog-days begin		47		13	22	55	☾ riſes	F
4	C	4 S. aft. Trin. *Tr. St. Martin*		48		12		50	9 a 45	17
5	M			48		12		44	10 5	18
6	Tu	**Cam.** Commencement		49		11		38	10 19	19
7	W	*Thomas a Becket*		50		10		32	10 31	20
8	Th			50		10		25	10 44	21
9	F	**Cam.** Term ends		51		9		17	10 53	22
10	S	**Oxford** Act		52		8		10	11 11	23
11	C	5 Sunday after Trinity		53		7		2	11 30	24
12	M			54		6	21	53	11 57	25
13	Tu			55		5		44	morn	26
14	W			56		4		35	0 a 34	27
15	Th	*Swithin*		57		3		25	1 24	28
16	F			58		2		16	2 24	29
17	S	**Oxf.** Term ends	4	0		0		5	☾ ſets	N
18	C	6 Sunday after Trinity		1	7	59	20	55	8 a 45	2
19	M			2		58		44	9 0	3
20	Tu	*Margaret*		3		57		32	9 12	4
21	W			5		55		20	9 22	5
22	Th	*Mary Magdalen*		6		54		8	9 30	6
23	F			7		53	19	56	9 41	7
24	S			9		51		43	9 52	8
25	C	7 S. after Trin. St. James		10		50		30	10 9	9
26	M	*St. Anne*		11		49		17	10 31	10
27	Tu			13		47		3	11 2	11
28	W			14		46	18	49	11 49	12
29	Th			16		44		35	morn	13
30	F			17		43		20	0 57	14
31	S			10		41		5	2 24	15

Days	L. of D.	Day dec.	D. breaks	Tw. ends	Sun r. alt	Cl. bef. S.	7 Stars So.
1	16 28	0 6	No real Night.		7 19	3′ 28″	8 m 51
6	22	12			17	4 20	31
11	14	20			15	5 4	10
16	4	30			12	38	7 50
21	15 50	44			9	58	30
26	38	56	0 46	11 11	5	6 4	10

Auguſt hath xxxi Days.

Full Moon, 1ſt, 11 m. paſt 7 even.
Laſt Quarter, 7th, 59 m. paſt 11 night.
New Moon, 15th, 18 m. paſt 12 midn.
Firſt Quarter, 23d, 9 m. paſt 11 night.
Full Moon, 30th, 51 m. paſt 2 aftern.

Sun enters ♍
22 d. 2 h. 2 m.

1	C	8 S. aft. Trinity. Lammas	4 20	7 40	17n50	☾ riſes	F
2	M		22	38	35	8 a 22	17
3	Tu		24	36	19	8 36	18
4	W		25	35	3	8 47	19
5	Th		27	33	16 46	9 2	20
6	F	*Transfiguration* [*Jeſus*	28	32	30	9 16	21
7	S	Prs. Amel. b. 1783. *Name of*	30	30	13	9 34	22
8	C	9 Sunday after Trinity	32	28	15 56	9 58	23
9	M		34	26	38	10 32	24
10	Tu	*Lawrence*	35	25	21	11 18	25
11	W	Prs. Brunſ. b. 1737. Dog Days end	37	23	3	morn	26
12	Th	Pr. Wales bo. 1762	39	21	14 45	0 16	27
13	F		41	19	26	1 24	28
14	S		42	18	8	2 37	29
15	C	10 Sunday after Trinity	44	16	13 49	3 53	30
16	M	Pr. Fred. born 1763	46	14	30	☾ ſets	N
17	Tu		48	12	10	7 a 32	2
18	W		50	10	12 51	7 42	3
19	Th		51	9	31	7 52	4
20	F		53	7	11	8 5	5
21	S	Pr. Wm. Henry bo. 1765	55	5	11 51	8 20	6
22	C	11 Sunday after Trinity	57	3	31	8 38	7
23	M		59	1	10	9 4	8
24	Tu	St. Bartholomew	5 1	6 59	10 50	9 43	9
25	W		2	58	29	10 38	10
26	Th		4	56	8	11 56	11
27	F		6	54	9 47	morn	12
28	S	*St. Auguſtine*	8	52	26	1 27	13
29	C	12 S. aft. Trin. *Beh. J. Bapt.*	10	50	4	3 2	14
30	M		12	48	8 43	☾ riſes	F
31	Tu		14	46	21	7 a 1	16

Days	L. of D.	Day dec.	D. breaks	Tw. ends	Sun Eaſt	Cl. bef. S.	7 Stars So.
1	15 20	1 14	1 24	10 33	6 59	5′ 51″	6 m 46
6	4	30	44	13	54	23	27
11	14 46	48	2 2	9 56	49	4 42	8
16	28	2 6	20	38	44	3 47	5 49
21	10	24	35	23	38	2 39	30
[illegible]	52	42	50	9	33	1 19	12

September hath xxx Days.

Laſt Quarter, 6th, 20 m. paſt 2 aftern.
New Moon, 14th, 45 m. paſt 4 aftern.
Firſt Quarter, 22d, 23 m. paſt 8 morn.
Full Moon, 28th, 46 m. paſt 11 night.

Sun enters ♎
21d. 21 h. 29 m.

1	W	*Giles*	5 16	6 44	7h 59	7 a 13	17
2	Th	London burnt, 1666	18	42	37	7 27	18
3	F		20	40	15	7 46	19
4	S		22	38	6 53	8 8	20
5	C	13 Sunday after Trinity	23	37	30	8 40	21
6	M		25	35	8	9 21	22
7	Tu	*Enurchus*	27	33	5 45	10 16	23
8	W	*Nativity of the V. Mary*	29	31	23	11 23	24
9	Th		31	29	0	morn	25
10	F		33	27	4 37	0 34	26
11	S		35	25	14	1 45	27
12	C	14 Sunday after Trinity	37	23	3 51	2 59	28
13	M		39	21	28	4 7	29
14	Tu	*Holy Croſs Day*	41	19	5	☾ ſets	N
15	W	Ember Week	43	17	2 42	6 a 10	1
16	Th		45	15	19	6 22	2
17	F	*Lambert*	47	13	1 55	6 35	3
18	S		49	11	32	6 53	4
19	C	15 Sunday after Trinity	51	9	9	7 16	5
20	M		53	7	0 45	7 50	6
21	Tu	St. Matthew	55	5	22	8 40	7
22	W	K. Geo. III. cor. 1761	57	3	0s 1	9 48	8
23	Th		59	1	25	11 13	9
24	F		6 1	5 59	48	morn	10
25	S		3	57	1 12	0 44	11
26	C	16 S. aft. Trin. *St. Cyprian*	4	56	35	2 20	12
27	M		6	54	59	3 49	13
28	Tu		8	52	2 22	☾ riſes	F
29	W	St. Michael. Prs. Ch. Aug.	10	50	45	5 a 42	15
30	Th	*St. Jerome* [bo. 1766	12	48	3 9	5 58	16

Days	L. of D.	Day dec.	D. breaks	Tw. ends	Sun Eaſt	Cl. aft. S.	7 Stars So.
1	13 28	3 6	3 7	8 53	6 26	0′ 29″	4 m 50
6	10	24	21	39	20	2 7	32
11	12 50	44	34	26	14	3 49	14
16	30	4 4	45	15	7	5 33	3 56
21	10	24	56	4	1	7 17	39
26	11 52	42	4 7	7 53	5 55	9 0	21

Oɑober hath xxxi Days.

Laſt Quarter, 6th, 38 m. paſt 4 morn.
New Moon, 14th, 49 m. paſt 8 morn.
Firſt Quarter, 21ſt, 27 m. paſt 4 aftern.
Full Moon. 28th, 27 m. paſt 10 night.

Sun enters ♏
22 d. 6 h. 25 m.

1	F	*Remigius*	6 14	5 46	3s 32	6 a 18	17
2	S		16	44	55	6 46	18
3	C	17 Sunday after Trinity	18	42	4 19	7 24	19
4	M		20	40	42	8 16	20
5	Tu		22	38	5 5	9 17	21
6	W	*Faith*	24	36	28	10 29	22
7	Th		26	34	51	11 43	23
8	F		28	32	6 14	morn	24
9	S	*St. Denys*	30	30	37	0 59	25
10	C	18 S. af. Tr. **Cam.** T. beg.	32	28	7 0	2 9	26
11	M	**Oxf.** Term begins	34	26	22	3 18	27
12	Tu		36	24	45	4 27	28
13	W	*Tranſ. of K. Edw. Conf.*	38	22	8 7	5 38	29
14	Th		40	20	30	☾ ſets	N
15	F		42	18	52	5 a 5	2
16	S		44	16	9 14	5 29	3
17	C	19 S. aft. Trin. *Etheldred*	45	15	36	6 1	4
18	M	St. Luke	47	13	58	6 46	5
19	Tu		49	11	10 19	7 46	6
20	W		51	9	41	9 3	7
21	Th		53	7	11 2	10 29	8
22	F		55	5	24	11 56	9
23	S		57	3	45	morn	10
24	C	20 Sunday after Trinity	59	1	12 5	1 25	11
25	M	K. G. III. Ac. 1760. *Criſp.*	7 1	4 59	26	2 51	12
26	Tu	K. Geo. III. Pr. 1760	3	57	47	4 18	13
27	W		4	56	13 7	5 46	F
28	Th	St. Simon and Jude	6	54	27	☾ riſes	15
29	F		8	52	47	4 a 50	16
30	S		10	50	14 6	5 23	17
31	C	21 Sunday after Trinity	12	48	26	6 10	18

Days	L. of D.	Day dec.	D. breaks	Tw. ends	Sun Eaſt	Cl. att. S.	7 Stars So
1	11 32	5 2	4 19	7 41	5 49	10′ 37″	3 m 3
6	12	22	30	30	43	12 7	2 45
11	10 52	42	40	20	36	13 25	26
16	32	6 2	50	10	30	14 31	7
21	14	20	59	1	24	15 23	1 49
26	0 54	40	5 8	6 52	18	15 58	28

November hath xxx Days.

Laſt Quarter, 4th, 18 m. paſt 12 night.
New Moon, 12th, 42 m. paſt 11 night.
Firſt Quarter, 19th, 6 m. paſt 12 night.
Full Moon, 26th, 20 m. paſt 11 night.

Sun enters ♐
21 d. 2 h. 36 m.

1	M	All Saints	7 14	4 46	14 s 45	7 a 9	19
2	Tu	Pr. Edw. b. 1767. *All Souls*	15	45	15 4	8 13	20
3	W	Prs. Soph. b. 1777. Mich.	17	43	23	9 29	21
4	Th	[1 Ret.	19	41	41	10 46	22
5	F	Powder Plot 1605	21	39	59	11 55	23
6	S	Mich. Term beg. *Leonard*	22	38	16 17	morn	24
7	C	22 S. af. Tr. D. Cum. b. 1745	24	36	35	1 6	25
8	M	Prs. Aug. Soph. b. 1768	26	34	52	2 15	26
9	Tu	Ld. Mayor's Day at Lond.	27	33	17 9	3 25	27
10	W		29	31	26	4 37	28
11	Th	*St. Martin*	31	29	42	5 53	29
12	F	Mich. 2 Return	32	28	59	☾ ſets	N
13	S	*Britius*	34	26	18 14	4 a 1	1
14	C	23 Sunday after Trinity	36	24	30	4 43	2
15	M	*Machutus*	37	23	45	5 39	3
16	Tu		39	21	19 0	6 49	4
17	W	*Hugh*	40	20	15	8 16	5
18	Th	Mich. 3 Return	42	18	29	9 43	6
19	F		43	17	43	11 10	7
20	S	*Edmund, K. & M.*	44	16	56	morn	8
21	C	24 Sunday after Trinity	46	14	20 9	0 35	9
22	M	*Cecilia.* Old Mart. Day	47	13	22	1 58	10
23	Tu	*St. Clement*	48	12	34	3 23	11
24	W		50	10	46	4 47	12
25	Th	D. Gloſ. b. 1743. *Catharine*	51	9	58	6 10	13
26	F	[Mich. 4 Ret.	52	8	21 9	☾ riſes	F
27	S		53	7	20	3 a 55	15
28	C	Advent Sunday	54	6	30	4 48	16
29	M	Michaelmas Term ends	56	4	40	5 53	17
30	Tu	St. Andrew	57	3	50	7 6	18

Days	L. of D.	Day dec.	D. breaks	Tw. ends	Sun Eaſt	Cl. aft. S.	7 Stars So.
1	9 32	7 2	5 17	6 43	5 12	16′ 15″	1 m 7
6	16	18	24	36	6	16 7	0 47
11	58	36	30	30	1	15 38	27
16	8 42	52	36	24	4 56	14 48	6
21	28	8 6	43	17	52	13 37	11 af 41
26	16	18	49	11	48	12 6	20

December hath xxxi Days. 1784.

Laſt Quarter, 4th, 52 m. paſt 9 night. New Moon, 12th, 6 m. paſt 1 aftern. Firſt Quarter, 19th, 2 m. paſt 8 morn. Full Moon, 26th, 48 m. paſt 2 aftern.	Sun enters ♑ 20 d. 14 h. 58 m.

1	W		7	58	4	2	21 s	59	8 a	19	19
2	Th			59		1	22	8	9	32	20
3	F		8	0		0		16	10	42	21
4	S			0		0		24	11	48	22
5	C	2 Sunday in Advent		1	3	59		31	morn		23
6	M	*Nicholas*		2		58		38	1	0	24
7	Tu			3		57		45	2	12	25
8	W	*Conception of the V. Mary*		4		56		51	3	25	26
9	Th			4		56		56	4	41	27
10	F			5		55	23	2	5	59	28
11	S			5		55		6	7	23	29
12	C	3 Sunday in Advent		6		54		11	☾ ſets		N
13	M	*Lucy*		6		54		14	4 a	25	2
14	Tu			7		53		18	5	48	3
15	W	Ember Week		7		53		21	7	16	4
16	Th	**Cam.** T. ends. *O Sapientia*		7		53		23	8	45	5
17	F	**Oxf.** Term ends		8		52		25	10	11	6
18	S		Shorteſt D. at Lond. is 7 h. 44 m. 17 ſ.		allowing 9 m. 5 ſ. for refraction.			27	11	35	7
19	C	4 Sunday in Advent						28	morn		8
20	M							28	0	57	9
21	Tu	St. Thomas. Shorteſt Day						28	2	20	10
22	W							28	3	44	11
23	Th							27	5	7	12
24	F			8		52		25	6	26	13
25	S	Chriſtmas Day		7		53		24	7	32	14
26	C	1 S. aft. Chriſt. St. Stephen		7		53		21	☾ riſes		F
27	M	St. John		7		53		19	4 a	35	16
28	Tu	Innocents		6		54		15	5	49	17
29	W			6		54		12	7	3	18
30	Th			5		55		7	8	14	19
31	F	*Silveſter*		5		55		3	9	23	20

Days	L. of D.		Day dec.		D. breaks		Tw. ends		Sun Eaſt		Cl. aft. S.		7 Stars So	
1	8	4	8	30	5	55	6	5	4	45	10′	18″	10 at	59
6	7	56		38		58		2		43	8	14		37
11		50		44		59		1		41	5	58		15
16		46		48	6	0		0		40	3	32	9	53
21		44		50		1	5	59		39	1	2		31
26		46	0 inc.	2		0	6	0		40	1 bef.	27		9

CHRONOLOGICAL NOTES, &c. in 1784.

Dominical Letters	D C	Shrove Tueſday	Feb. 24.
Golden Number	18	Eaſter Day	Apr. 11.
Epact	7	Whit-Sunday	May 30.
Cycle of the Sun	1	Trinity Sunday	June 6.
Roman Indiction	2	Advent-Sunday	Nov. 28.

ECLIPSES, &c.

THERE happen 4 eclipſes this year, viz. 2 of the ſun, and 2 of the moon; of which one only of the moon will be viſible here.—I. Sun is eclipſed Feb. 20, at half paſt 8 afternoon, long after the ſun is ſet.—II. The moon is viſibly eclipſed, March 7, early in the morning: the beginning is at 2 h. 16 m. the middle 3 h. 28 m. and the end is at 4 h. 40 m. the digits eclipſed being 4° 36′ on the moon's north limb.—III. Sun eclipſed Aug. 15th, at a quarter paſt midnight, and therefore inviſible to us.—IV. Moon eclipſed Aug. 30th, at about 3 quarters after 2 afternoon; and inviſible, as ſhe riſes not till near 7.

VENUS is a morn. ſtar till Aug. 8; and then an even. ſtar to the end.
JUPITER a morn. ſtar from Feb. 3 till Aug. 25; and then an even. ſtar.

ANSWERS to the ENIGMAS.

1. G.
2. Good Nature.
3. Ship.
4. To-morrow.
5. Smoothing Iron.
6. Tripthong.
7. Beauty.
8. Hair Pencil.
9. Horns.
10. Snuff Box.
11, or *Pr.* Silence.

The Prize Enigma anſwered by the Rev. Mr. Tho. Baker.

Tho' ſweet my dear-lov'd Celia's voice,
Her *No* gave diſcontent;
Yet ſoon did my fond heart rejoice,
When *Silence* bluſh'd conſent.

The ſame by Miſs Betty Smales.

Near where a ſtream in ſoothing murmurs flows,
Meandering through yon ſolitary vale,
Where lovers oft repeat their tender woes,
While pitying echo ſhares the mournful tale,
Neglected Delia met her perjur'd ſwain,
And thus in ſighs and tears the youth addreſs'd:
"Ah, Damon! doſt thou glory in my pain!"—
Expreſſive looks, and SILENCE ſpoke the reſt.

Eugenio's Anſwer to the ſame.

From cities far, midſt ſylvan ſhades,
The rural ſwains and gentle maids,
Surrounded by the prize,
Might ſoon perhaps its meaning gueſs;
It puzzled me, I muſt confeſs,
But let not that ſurprize:
For who within the city's bounds,
Where never-ceaſing noiſe ſurrounds,
Could *Silence* think to find?
Let then *his* praiſe each pen employ,
Who gave us *Silence* to enjoy,
Where ev'ry ſound's combin'd.

The ſame by Mrs. B. of Saliſbury.

"Says Teague, for the prize why d'ye puzzle your brain?
"I'll anſwer't in SILENCE; come hear me explain."

The

The Prize Enigma anſwered by The Highland Laddie.

Beneath a brae in yonder howm,
Where haleſome breezes chear the day,
Young Jenny all in *Silence* mourn'd—
She mourn'd for Jamie, far away.
For now three langſome years were over,
Since far fra' a' he anes held dear,
By revers fell ſhe tint her lover,
And aft ſhe ſhed the briny tear.

The weſtlin ſun was juſt declining,
When Jenny rais'd her languid head:
"How lang, ye gods! wi' grief repining,
Shall Jenny's heart wi' anguiſh bleed?"
Scarce had ſhe ſpoke, when haſting to her,
Her Jamie's weil-kend form ſhe ſaw;
Joyfou' ſhe raiſe to meet her lover,
And ev'ry care was chas'd awa'.

Mrs. Blanch Lean's Addreſs to Lady Diaria.

For certain, Madam, you but only jeſt,
When SILENCE to us you would recommend;
For ſhould your friends take your advice at leaſt,
Believe me, Ma'am, your fame would quickly end.

Laura's Anſwer; inſcribed to Mr. R. Richardſon.

Had Heaven, indulgent to my fond requeſt,
To ſooth the pain that rends my tortur'd breaſt,
In kind compaſſion ſent the youth I love,
To urge his ſuit, and all my woes remove;—
Sent him array'd in all his glowing charms,
And giv'n her Phaon to a Sappho's arms;
I ne'er had wiſh'd to ſue without a claim,
Or public thus avow my hopeleſs flame,
'Mongſt rival bards his *Silence* to diſcloſe,—
That *Silence*, fatal cauſe of all my woes!
Which dooms me ſtill unpitied to complain;
While crowds of ſighing vot'ries ſue in vain.
For hapleſs Laura ne'er muſt hope relief,
While fancy feeds the dearer ſprings of grief,
—Go, favour'd youth! go woo ſome happier maid,
While Laura's left to pine beneath her native ſhade.

The ſame anſwered by Marcus.

At the court of Apollo one day I attended,
When, SILENCE being call'd, lo! the buſineſs was ended!

The ſame by Miſs Eliz. Anderſon, of Queen-ſq. Bloomſbury.

Dear ladies, ſhould it be your fate,
To enter in the marriage ſtate;
And you a huſband chance to find,
Of temper peeviſh and unkind:
When he is angry, be you mute,
For *Silence* often ends diſpute;
And ſooth his paſſion with a ſmile—
You'll find this maxim worth your while.

Miſs Mary Milnthorp thus anſwers it.

When theſe vaſt orbs from nothing firſt were made,
And their Almighty architect diſplay'd;
Then SILENCE fled before the blaze of day,
And hid herſelf far from the ſolar ray:
But at the laſt great day, when all muſt riſe,
To meet their great Creator in the ſkies;
In ſilent expectation then they'll wait,
To hear their laſt, unalterable fate.

Leonora's Advice to Dr. Conundrum.

Good Dr. your wit I commend,
But in *Silence* how can it appear?
And if you're in love, my old friend,
Sure *Silence* ne'er conquers the fair.

The Prize Enigma anſwered by Sylvia.

When the fond youth in rapture tells his tale,
And finds the power of language nought avail,
The *ſilent* tear more eloquent will prove,
To win fair Celia, and enſure his love.

Miſs Diana Browne's Anſwer.

Silence! dear ladies! — let it not be ſaid,
"That womens tongues of aſpen leaves are made."

The ſame by Mr. Thomas Truſwell.

With heart elate, behold the ſhepherd ſwain,
With ſweet Myrtilla trip the flow'ry plain;
Behold her cheek with carmine bluſhes glows,
In all the beauties of the blooming roſe:
The amorous youth implores her friendly aid;
To Hymen's ſhrine invites the lovely maid;
She ſilent ſtands, nor does the youth controul,
For silence ſpeaks the language of her ſoul.

Other ſeparate and ingenious anſwers were alſo given by Meſſrs. Alliſon, Amintor, Aplin, Aſhburner, Bayley, Booth, Brown, T. Browne, G. C, Miſs Chatter, Church, Cleypole, Cope, Creep-mouſe, Dalton, Davies, Dening, Dowden, Eland, Elvira, W. F, Firth, G. Fletcher, J. Fletcher, Fox, Frankly, French, Y. Gent, J. H, P. H, Hebe, Homeſpun, Jackſon, Miſs Iſ. Kendrick, Laconicus, Lee, Siera Leona, Lodge, May, Morley, Morris, Nauticus Secundus, Nield, Nimrod, Orbit, Pidgley, Rebſur, Rivers, S. Roberts, T. Roberts, Rowe, Miſs A. Rubwell, Mrs. Rubwell, Ruſticus, Shin, Smith, Mrs. Eliz. Smith, Stafford, Swiſt, J. T, Terril, Treleaſe, W. W, Miſs Sarah Walker, Walton, Wanſbeckarian, Went, Willet, Woolſton, Wragg, and others.

A General Anſwer to all the Enigmas by the Rev. Mr. T. Baker.

On the Fall of the Leaf. Addreſs'd to Celia.

How ſweet was ſpring to me,—nor ſummer leſs,
When bleſt with you my charming ſhepherdeſs;
But thoſe delightful ſcenes with you are gone,
And your fond ſhepherd left to ſigh alone!
Where, midſt gay *ſmiles* you ſung harmonious ſtrains, 1, 2
Now a dead *ſilence* unmoleſted reigns; Pz.
As fall the leaves from thoſe once pleaſing ſhades,
So in thy abſence faithful Damon fades!
Yet ſhall the muſe her lateſt tribute pay,
And to his ſhepherdeſs their fall convey.
The ſhort'ning days, the ſullen clouds appear,
And howling winds proclaim ſtern winter near;
Old ocean feels their pow'r—her billows riſe,
And *ſhips* high mounting meet the ſtormy ſkies. 3
See how the trees their ſhady honors caſt;
The dying leaves toſs'd by the piercing blaſt!

Thoſe pleaſing ſhades which lately charm'd the eye,
Now in confuſion o'er the paſtures fly:
See how they fall! — Conſider, deareſt maid,
Tomorrow's ſun may ſee your beauties fade! 4
One ſummer's reign is all the leaves can boaſt,
Winter comes on and all their charms are loſt;
No more they pleaſe — nor to their bow'rs repair
The happy lover with his fav'rite fair.
Such is the vanity of earthly charms,
Which age, pale ſickneſs, or grim death diſarms;
Oft by all three is form'd the lifeleſs ſhade,
As is a *triphthong* by three vowels made. 6
How vain the nymph by baſe ambition fir'd,
Whoſe happineſs conſiſts in be'ng admir'd;
For whom the *pencil*, and the *box-iron* glide, 8, 5
O'er flow'ry lawns, as to adorn a bride;
Who while the gold *ſnuff-box* her hand adorns, 10
Crowns her fond huſband with a pair of *horns*; 9
Swift fly thoſe joys,—ſoon ſink their ſparkling eyes;
The roſes fade, and pamper'd *beauty* dies! 7
Not ſo the virtuous, they have charms will bloom,
'Midſt ſtorms of ſickneſs, death, and worlds to come;
Age nor the grave can ne'er decreaſe their ſtore,
For they ſhall ſhine when time ſhall be no more;
Soon as on earth their toilſome labours ceaſe,
They bloom in heaven with the prince of peace.
May you, dear Celia, when the gloomy ſhade,
Of death comes on, and like a leaf you fade;
May you enjoy eternal bliſs with them,
And ſweetly bloom in new Jeruſalem.

Miſs Betty Smales's Addreſs to Miſs Richardſon of Whitby.

Eliza! thou pride of my ſong,
Awhile thy gay pleaſures ſuſpend;
Far, far from the buſtling throng,
Retire to thy ruſtical friend.
The muſe who her loſs did lament,
And vow'd never more to be free;
Is ſomewhat inclin'd to content,
And finds a ſweet ſolace in thee.
Good-nature our permanent care,
'Tis ſhe can true bleſſings impart,
Un*ſhip* all the tumults of war,
That vice can inflict on the heart.
Thus ſhielded what have we to fear,
Tomorrow's ills ſtill are unſeen;
She'll *ſmooth* ev'ry croſs we've to bear,
And make all our paſſions ſerene.
From *beau*'s, and fine belles turn aſide,
Whoſe *beauty* is tranſient and vain!
High puff'd up with *paint* and with pride;
Haſt, haſt to the village again.
The lark and the echoing *horn*,
Melodiouſly ring thro' the ſky,
To hail the return of the morn;
The woodlands and valleys reply.
All day unreſtrain'd let us roam,
While pleaſure invites to the grove;
Ere night we will fly to our home,
On wings of true friendſhip and love.
With muſic our friends we'll amuſe,
Th' ambroſial ev'nings to cloſe;
The *ſnuff-box* hand round if we chuſe,
Then *ſilently* ſink to repoſe.

Mrs. Lean's Elegy on the ſuppoſed Deaths of ſeveral Correſpondents.

Come muſe in cypreſs crown'd, aſſiſt my ſong,
In mournful ſtrains Diaria's loſs to grieve; 1
Her daughters *ſweet* — and ſons of fame are gone, 2
They've ceas'd to write — ah! have they ceas'd to live.
When ſome lone *ſhip*, driven by the northern blaſt, 3
In a dark night's inhoſpitable gloom,
In vain for day the ſailors look aghaſt,
Tomorrow corpſes they are all become. 4
Even ſo we fear the *iron* hand of death, 5
Has laid in duſt the bards we now deplore;
Each *letter'd* ſage has yielded up his breath, 6
And all their wit and humour are no more.
Beauty has ceas'd the raviſh'd ſenſe t'engage, 7
Defac'd by time the reg'lar features lie,
Or ſnatch'd by death from life's all-var'ing ſtage,
The opening bloſſoms ſcarcely *bloom* — and die. 8
And muſt my lyre, like theirs, be ſoon unſtrung,
My muſe grow languid, and refuſe to rhyme;
Yes—when by fate my thread of life is ſpun,
'Twill ſoon be *ſhorn* by all-devouring time. 9
Diſeaſe or age will *ſnuff* my vital lamp, 10
And to the duſt conſign my mortal frame;
There *ſilent* mould'ring in the grave's chill damp, *Pr.*
Oblivion ſoon will cover up my name.

The Enigmas anſwered by Eugenio.

See ſmiling peace return again,
A thouſand bleſſings in her train.
No more ſhall *ſhips* tranſport afar
The *iron* implements of war;
No more the battle's dreadful roar
Diſturb the *ſilence* of the ſhore;
Nor *horn*'s, nor drum's, nor trumpet's ſound,
Each day from camp to camp reſound ——
No more the widow'd wife ſhall mourn
O'er her ſlain ſoldier's ſilent urn;
Then, turning, view her children dear,
And wet her *ſnuff-box* with a tear;
No more ſhall penſive beauty prove
A painful abſence from her love;
Nor longer view with pleaſing pain,
The *pencil*'d likeneſs of her ſwain.
Tomorrow's ſun may bring the youth,
Crown'd with *good-nature*, love and truth,
To ſooth the ſorrows of her breaſt,
And lull her ev'ry care to reſt.

The Enigmas and Rebuſes anſwered by Tony Lumpkin.

To Mrs. Rubwell.

Tho' a ſtranger to you yet I ſeem much inclin'd,
Good Madam, to tell you a piece of my mind.
It ſeems unbecoming a fair one like you,
Thus year after year unregarded to ſue. 1
Since the doctor in *ſilence* can paſs o'er your lay, *Pr.*
His *good-nature* no longer you've cauſe to diſplay. 2
Shall that *b*EAU*ty* be waſted in ſighing or tears, 6, 7
To *paint* how deep *root*ed your paſſion appears; 8, (2, 6 *reb.*)

Whilſt he with his bottle or *ſnuff-box* amus'd, 10
Seems regardleſs how much for his ſake you're abus'd?
No, ere I to him would another word ſay,
Thro' *Wilton*'s fam'd ſtreets I'd be dragg'd on a *dray*. (4, 5 *reb.*)
Then take my advice, chuſe a lover that's younger,
Becauſe the fond court*ſhip* may laſt ſo much longer. 3
See, youthful Eugenius his errors confeſs,
Then why not conſent to relieve his diſtreſs?
His numbers harmonious Diaria adorns,
Whilſt he ſeeks a kind wife, and ne'er thinks about *horns*. 9
There's *Newton*, and *Jones* too, then baniſh all ſorrow, (3, 1 *reb.*)
So till the next year I ſhall bid you good *morrow*. 4

The Enigmas anſwered by Mr. John Stafford.

1. Lo! winter our plains has forſook,
And ſpring all her *b*EAU*ties* diſplays;
Unchain'd now the *ſmooth* limpid brook,
Thro' its channel ſo *ſilently* ſtrays.
2. See the lovely younG nymphs and the ſwains
Trip the meads in *good-humour* along;
Thro' the ſkies *ſail* the birds, while the plains
And the woodlands reſound to their ſong.
3. How delightful does nature appear!
What *pencil* her charms can deſcribe?
To *inhale* the ſweet morn-ſcented air,
Oh how oft could I walk with my bride!
4. No care ſhould my thoughts e'er invade,
Nor with Stella have fear of a *horn*;
My fond wiſhes then crown, charming maid,
And *tomorrow* my cottage adorn.

Mr. Tho. Eland's Addreſs to Miſs Betty Smales.

1. Dear maid, what chance has rob'd thee of thy friend?
Say, is he call'd on board ſome *ſhip* of war? 3
To quell thy foes, thy *virtues* to defend, 2
And ſpread Britannia's triumphs wide and far.
2. Perhaps ſoft peace and he may ſoon appear,
Perhaps *tomorrow* ere the dawn of day, 4
With laurels crown'd, and ſheath'd the hoſtile ſpear,
To taſte thy ſweets, and hear thee charming play.
3. But ſhould thy friend (forbid it heav'n) be dead;
More cruel ſtill, ſhould he unfaithful prove;
Oh! what ſhall then ſupport thy drooping head,
Beneath the weiGht of diſappointed love? 1
4. Lo here I come, a youth in prime of years,
Stranger to flattery, unknown to guile,
With me join hands, and bid ad*ieu* to fears, 6
Love and be happy in my conſtant ſmile.
5. A faithful friend, a lover kind and true,
A tender huſband, kind to only thee.
Hence all ye *painted* train, falſe *beauties* you; 8, 7
Let Betſy only deign to ſmile on me.
6. Then happy in our *tranquil* rural *cell*, *Pr.* 5
We'd paſs thro' life without one ſingle puff.
Horns on my brows? no miſs, we'd love too well; 9
And often take a friendly pinch of *ſnuff*. 10

All the Enigmas anſwered by Mr. Tho. Roberts.

Ye gods! how great a virgin's pow'r
When *temper ſweet* inſpires;
Her language cheats the fleeting hour,
And ev'ry boſom fires.
Mild is Lavinia's gate; ſhe walks,
Or rather ſeems to glide,
As ſlides a *veſſel* from the ſtocks,
And ſkims the ſilver tide.
Tomorrow, if the fates be kind,
(Then roll, dear time! roll on)
Cupid and Hymen have aſſign'd
To join us both in one.

The *ſmoothing-box*, all burniſh'd
My *queen* of *beauty* guides; [bright,
And lo! from whence doubt takes her
Spontaneous faith reſides. [flight,
Light as the *bruſh* that ſcarcely rears
The honours of the trees,
My heart exults, now void of fears,
The ſacred *horns* to ſeize.
Behold her pledge, the *box* I bear,
My faith ſhall ſoon be prov'd;
And, wrapt in *ſilence*, all the fair
Shall wonder how we lov'd.

The ſame anſwered by Delia Dunelmenſes.

Venus, *love*'s goddeſs, *ſmooths* ſoft *beauty*'s charms, 2, 5, 6, 7
Europa fixes in the Thunderer's arms,
The ſwelling canvas on the ocean ſleeps; 1
No *bruſh* of wind diſturbs the glaſſy deeps. 8
Jove, ardent haſt'ning, *ſnuffs* the yielding air, 10
And catches on his *horns* the frighten'd fair. 9
Europa captur'd, Taurus ſteels away,
Urges his paſſage, and becalms the ſea:
Through the ſmooth'd iſthmus his Amanda bears,
Safe in her *bark* ſhe *ſilences* all fears; 3, *Pr.*
Soon to the approaching promont, cut their way;
Know no *tomorrow*, but enjoy to day. 4

The ſame anſwered by Homeſpun, of Bath.

Dear lady Di. for once I'll try
Your riddles to explain,
Tho' little ſkil'd, and with fear fill'd
Leſt I no credit gain.——
The firſt to me appears a G,
Good humour is the 2d,
And on my word a *ſhip*'s the 3d,
Tomorrow 4 I've reckon'd.

Box-iron ſtrong, and then *triphthong*,
Each for its turn muſt wait;
Next *beauty* bright appears in ſight,
And ſoft *hair-pencil*'s th' 8th.
In 9 moſt clear the *horns* appear,
I'the 10th a *box* is meant;
Pray is't not ſo? you cant't ſay no,
And *ſilence* gives conſent.

The ſame by Mr. J. Jackſon, at Hutton-Rudby School.

Being an elegy on the late celebrated mathematician Mr. William Emerſon, of Hurworth, near Darlington, who died there laſt year, aged upwards of 80 years, the regiſter of his baptiſm being in the year 1700.

Attend ye muſes to this mournful ſtrain:
Fair ſcience from the winding Tees is fled; 1
Fate gave command, all mortal aid was vain;
Great Emerſon lies number'd with the dead.
How chang'd the ſcene! the *pleaſing-ſmile* no more, 2
Alas! ſhall deck his ever-honour'd face;
The minute-guns from every *ſhip* ſhall roar; 3
Since ſcience now has loſt her greateſt grace.

Tomorrow may ſome fatal news proclaim ; 4
But to Minerva none more fatal prove ;
The drooping Nine, ſtern death will ever blame ;
And for great Emerſon proclaim their love.
O lead me where his ſolemn *box* doth lay, 5
Where he's envelop'd in his clay-cold earth ;
There will I ſit and mourn the live-long day ;
And bid *adieu* to ſong, to dance, and mirth. 6
In vain ſhall *beauty* drop the pitying tear, 7
With *pencil* ſtrive again to give him birth ; 8
The ſons of genius whom his works ſhall rear,
Will find a monument of endleſs worth.
Full well to you, diarian youths, are known,
The laſting treaſures he has left behind ;
Like Copia's *horn*, from ev'ry page are thrown 9
Inſtructive leſſons to improve the mind.
Ye fair, whene'er ye view thoſe lovely charms
In *ſnuff box* lid, or glaſs on toilet plac'd ; 10
Yet think, thoſe beauties that each boſom warms,
By death's cold hand muſt ſoon be all defac'd.
Like Emerſon, in *ſilence* muſt you lie ; Pr.
In vain the ſculptur'd tablet ſpeaks your name;
Thoughtleſs each paſſenger will paſs you by ;
Unleſs, like him, your virtues ſpeak your fame.

The ſame by Mr. J. Bumſted, jun.

1. With trembling caution may I
The pegaſean friſky ; [mount
And jaunt it to the muſes fount,
To ſip their highland whiſky ?
2. Like Sancho, fear *tomorrow*'s dawn,
And dread the airy *ſailing* ;
Or, with Quixotic courage, ſcorn
A *ſilent*, fearful failing :
3. Or, as no *beauteous tripthong*'s
Along my ſimple meaſure, [view'd
Can I with *horns*, *bruſh*, *boxes* rude,
E'er give poetic pleaſure.
4. But faireſt Di. excuſe my ſtile,
So rough and unconnected ;
My *modeſt* muſe, if you but ſmile,
Gains all ſhe e'er expected.

Various other ingenious anſwers were given by Meſſrs. Amintor, Bayley, Miſs Diana Browne, Tho. Browne, G. C, Calophilus, Firth, G. Fletcher, J. Fletcher, Florella, Fox, Miſs Maria G, J. H, Hall, Harris, Herod, Jones, Keith, Laconicus, Laurinda, Siera Leona, Morley, Nield, Philodiaria, Rowe, Ruſher, Smith, Swift, Taciturnus, Tattam, Miſs Sarah Walker, L. W, Walton, Went, Willet, Woodbouſe, Wragg, &c.

ANSWERS to the REBUSES and QUERIES.

The REBUSES anſwered by Miſs Jingle.

Jones, *Paint*, and *Newton*, *Wilton*, *Dray*, *Potatoe*,
Solve all your rebuſes as ſure as fate O.

The ſame anſwered by Miſs Tomboy.

Newton's the genius of renown,
Jones is the bard that's meant,
And *Wilton* is the trading town ;
What ruins health is *paint* ;

Dray and *Potatoe* alſo join'd,
You'll have before your view,
Each of the rebuſes defin'd;
So ladies fair adieu.

The ſame by Mrs. B. of Saliſbury.

'Tis *Jones* the ingenious Northamptonſhire bard;
A *Dray* the odd carriage, it reſts in a *yard*:
Potatoes are homely, but food for us all;
And *paint*, tho' pernicious, is ſeen at a ball.
The genius is *Newton*, for greatneſs admir'd;
The town is call'd *Wilton*—no more is requir'd.

The REBUSES anſwered by the Highland Laddie.

Let *Jones* at *Wilton* ſpend the day,
And fill his noggin fra' the *dray*:
Or Teague his ain *potatoes* leave,
And to ſome *painted* laſſie cleave.
I ne'er ſhall envy chields like theſe;
Mair ſaft delights my heart can pleaſe.
With Locke or Boyle I'll paſs the day,
Or to the lift wi' *Newton* ſtray;
Syne, by ſome wimpling burnie fair,
Laugh at the great and a' their care;
And as the blithſome moments paſs,
To pleaſe my bonny winſome laſs,
If ſhe be near, her praiſe I'll ſing,
Till ilka hill and valley ring.
Thus ſpend my time wi' heart as leel,
As they wha' dance on fortune's wheel.

Eugenio thus anſwers the Rebuſes.

Great *Newton*'s the genius for ſcience renown'd,
And *paint* to the fair prejudicial is found;
Malvalio's *potatoe*'s with novelty dreſt,
And London or *Wilton* muſt pleaſe every gueſt;
The *dray* when at reſt ſhould be plac'd in the *yard*,
And *Jones* is the pleaſing Northamptonſhire bard.

The ſame anſwered by Miſs Diana Browne, of Honiton.

Friend *Jones* I have heard's
A Northamptonſhire bard,
Paint ruins the health of the fair;
Sir Iſaac you'll find
Of an exalted mind,
And *Wilton*'s the town I declare.
Then next I'll eſſay
To turn backward a *dray*,
When yard ſtreight appears to my eyes;
Dray yard without doubt
Smith's rebus makes out,
And *potatoe*'s the laſt in diſguiſe.

Calophilus thus anſwers the ſame.

Whilſt *Jones* in ſoft numbers the Perſian pourtrays,
Or *Newton* the ſecrets of nature diſplays;
Whilſt *Wilton* with Turkey endeavours to vie,
And *paints* in her loom all the tints of the ſky;
The *dray*man, unheeding of artiſt or ſeer,
Joggs on with his cabbage, *potatoes*, or beer.

Hebe's anſwer to the Rebuſes.

On *Newton*'s wings ſublimely ſoaring,
At *Wilton*, *Jones* may ſpend his time:
The *ruſtic*, Ceres aid imploring,
To load his *dray* with draughts divine.
Let thoſe who health for titles barter,
(Where *nature's roſes* we miſtake)
Sigh for a wretch in ſtar and garter,
And forfeit honour for his ſake.

Still this be my ſupremeſt pleaſure,
To ſeek fair virtue in the ſhade;
Claſp to my heart the darling treaſure,
Nor let one looſer thought invide,

Other ingenious anſwers to the rebuſes were given by Meſſrs. Amintor, Anderſon, Bayley, Booth, Bumſted, Dening, Eland, Elvira, W. F, Firth, G. Fletcher, J. Fletcher, Fox, Frankly, Hall, Harris, Homeſpun, Jackſon, Laſhmar, Mrs. Lean, Lee, Nield, Philodiaria, Rowe, Shin, Miſs Smales, Smith, Swift, J. T, Tattum, Miſs Walker, Walton, Willet, Wincott, Woodhouſe, and Wragg.

QUERY I. anſwered by Calophilus.

No animal in the creation ſeems to be ſo beneficial to mankind as the cow. For, whilſt living, her milk in itſelf, and the butter and cheeſe which are produced from it, yield a wholeſome, nouriſhing, delicious repaſt; beſides the benefit of oxen for plowing the land to furniſh us with bread, &c. And when ſlaughtered, ſhe is uſeful in various reſpects; for beſides that from the fleſh we have the excellent food of beef and veal, the hides are manufactured into leather for numerous purpoſes; her hair ſerves the plaiſterer; the horns, hoofs and ſhanks are employed in making knife-handles, buttons, lanthorn-lights, horn ſhavings, &c. and her very bones, when properly cruſhed, make valuable manure. — And of this ſame opinion is Mr. *J. Jackſon*. — But Meſſrs. *Dening*, *Firth*, *Hewett*, *Roberts*, *Rowe*, and *Walton* give the preference to ſheep, on account of their wool for cloathing.

QUERY II. anſwered by Mr. J. Walton.

Judge Blackſtone (in his Comment. vol. 1. lib. 1.) writes that "Pope Innocent the IIId. (in the beginning of the 13th century) was the firſt who ordered the celebration of marriage in the church; which before was a civil contract." But the ſolemnization of matrimony in the church in this nation was not till much later; "for in the time of the grand rebellion, marriage was performed by the juſtices of the peace," and rendered valid by ſtat. 12. Car. II, c. 33. So that from that time, namely 1533, it has been veſted in the hands of the clergy. — *Calophilus* and Mr. *Jackſon* alſo anſwered this query.

QUERY III. anſwered by Mr. Thomas Roberts.

It is a natural quality of all dry ſubſtances, to reſiſt water in a ſmall degree. Hence, the top of the cup being ſuppoſed to be dry, the ſhillings, or any other ſmall thing, being not ſo great as to overcome the reſiſtance, and ſlipped in with a ſteady hand, the water will riſe above the dry edge, without running over, till ſo many are put in, as to cauſe the weight of the heaped-up part to overcome the repulſion of the dry edge. —The truth of this propoſition may be proved various ways, but by none more ſimple and eaſy, than by dipping your finger in the water, and wetting the edge of the cup with it, upon which all the water which is above the rim of the cup will run over.— Solutions were alſo given by Meſſrs. *Calophilus*, *Jackſon*, *Rowe*, and *Walton*.

QUERY IV. anſwered by Mr. F. Wragg.

The diſcontinuity of parts, is the principal cauſe of the opacity of bodies, by means of the many reflections made in the interſtices; which will more plainly appear by conſidering, that many opaque ſubſtances become tranſparent by filling their pores with a ſubſtance of equal or nearly equal denſity with their parts. So paper, oiled or varniſhed, will become more tranſparent, by the oil or varniſh intimately pervading its pores. On the other hand, the moſt tranſparent ſubſtances, by evacuating their pores or ſeparating their parts, may be rendered conſiderably opaque.—A fuller inſight into this matter may be gained from Sir *I. Newton*'s Optics, lib. 2. pt. 3. — Solutions to this query were alſo given by Meſſrs. *Calophilus, Elſtob, Jackſon, Roberts, Rowe,* and *Walton*.

QUERY V. anſwered by Mr. J. Jackſon.

Large and deep waters have the power of abſorbing light conſiderably, while ponds, &c. being ſmall and ſhallow, act more like mirrors, and conſequently reflect the rays of the ſun on objects placed above them.

Mr. *Thomas Roberts* ſays, It is well known that poliſhed ſurfaces are capable of a ſtronger reflection than unpoliſhed ones: the reaſon is, that in the firſt caſe the rays are reflected all in one parallel, and in the latter they are reflected various ways, by which diſperſion the image is prevented which would otherwiſe be formed. Now no particles of light can enter the water but thoſe which meet its pores, the reſt being all reflected as from a poliſhed ſurface. And earth, being an unpoliſhed ſurface, cannot reflect ſo ſtrongly, for the reaſon above given.

And *Calophilus* ſays, We may ſometimes be led into an error by reaſoning anologically upon objects which are ſeen at a diſtance from ſuch as are near at hand. However, it has been urged in favour of the opinion that the dark ſpots upon the moon are collections of water, that the water upon our globe reflects vigorouſly the rays of the ſun towards one part, yet in another it is of a dark blackiſh hue. But what ſhall we ſay to thoſe who utterly deny that there are any ſeas in the moon? Where there ſeems to be room for ſuch oppoſite opinions, it muſt be difficult to arrive at certainty.

Mr. *Rowe* and Mr. *Walton* alſo anſwered this query.

NEW ENIGMAS.

I. ENIGMA 648, by Mr. H. Morris.

I'm moſtly ſeen in woods, or lofty grove,
Where wanton fauns in peace and freedom rove;
Tho' ſometimes found upon thoſe happy plains,
Where gentle ſhepherds chaunt their love-ſick ſtrains;
While vocal muſic, which excels their flute,
From me is heard; yet I am always mute.
I, Proteus-like, in various forms appear,
In colour vary with the fleeting year;
Sometimes I'm found array'd in lovely green,
At others in a ſable hue I'm ſeen.——
Should e'er the reſtleſs foe this iſle invade,
In me alone will Britons look for aid:

For know that I, in time of danger, ſtand
The greateſt bulwark of this happy land.

II. Enigma 649, by Calophilus.

Ah luckleſs me, of caitifs ſure the worſt!
With want and wretchedneſs ſupremely curſt!
Forc'd ev'ry drabs vile dictates to obey,
I'm drown'd, and hang'd, and tortur'd every day:
The witleſs ſport of every idle fool,
Who oft thro' me's the butt of ridicule.——
Tho' ſuch my fate, O ſmooth your brows ye fair,
Nor from me turn with ſupercilious air;
For, with a thouſand woes tho' I'm diſtreſs'd,
My ſire perhaps was to your boſom preſt:
And, ſpite of ſcorn, me you muſt own at leaſt
A faithful uſeful ſlave at every feaſt;
My place vacated you with ſpleen would hear,
And e'en to taſte of richeſt food forbear.
And tho' at length by time and ills worn out,
Neglected, ragged, toſs'd and kick'd about,
A lovely form perhaps I ſoon may wear,
And far outſhine the faireſt of the fair:
To their ſoft wiſhes gentle ſuccour lend,
And Lowth or Maſon own me for his friend.

III. Enigma 650, by Malvolio.

Liſten to my tale, ye fair:
If perchance it makes you ſtare,
Stare me thro', if ſuch your will;
Us'd to theſe, I'll think no ill.
Seldom look'd at, often ſeen,
I'm a partial go-between;
Theſe I ſcreen from others view,
While their fancy they purſue:
Yet I *thoſe* to theſe expoſe,
(Be they friends or be they foes.)
Still, to theſe nor thoſe inclin'd,
Upright 'twixt them me you'll find.
Pray then, ladies, do you ſee
How ſo partial I can be?
View me right, I'm like a picture;
Subject truly to this ſtricture,
Nothing to my canvas cleaves
Of the ſhapes the eye perceives.
Look howe'er, you'll ſee perſpective,
Good and true beyond invective;
Critics dare not find a fault.
Houſe, and land, and heaven's vault,
Theſe and more I let you view;
Somewhat dimm'd by me, 'tis true.
Motion I exhibit ſuch,
Reynolds' ſelf, with heav'nly touch,
Can't in this way equal prove,
Tho' in fancy far above.

IV. Enigma 651, by Amintor.

Of hair and bone and excreſſence compos'd,
  Without or ſkin or horn or feather ſeen;
Am always, ladies, for your uſe diſpos'd,
  Nor diſregarded am by England's queen.

Your native beauty's heighten'd by my art;
  Yet I diſclaim the rouge's baleful aid;
Let Gallic females ſuch dire arts impart,
  Be they diſdain'd by every Britiſh maid.

To poliſh nature I with truth profeſs,
This is my only buſineſs here on earth;
My very foes this virtue muſt confeſs,
And envious pay this tribute to my worth.

What anxious ſighs heav'd young Philander's breaſt,
When lovely Celia's lips he ſaw me kiſs,
When to her mouth I was ſo eager preſs'd:
Worlds he'd have given but to ſhare my bliſs.

V. Enigma 652, by Mr. Iſaac Gumley, Exciſe Officer.

From duſt I ſprung like all the human race.
In times long paſt my origin you'll trace;
For Adam, doubtleſs, when he left his bow'rs,
Clear ſilver ſtreams, and aromatic flow'rs,
Apply'd to me, and ſought my kind relief,
To chear his ſpirits and diſperſe his grief:
And all his ſons, black, tawny, brown, or white,
With ardour, ſeek me morning, noon, and night.
For me the good man makes his daily pray'r,
And when poſſeſs'd affords his ſons a ſhare;
For me the matron quits her downy bed,
Ere Phœbus paints the eaſtern ſkies in red;
For me the ſeaman plows the boiſt'rous ſeas:
For me the ſoldier quits the lap of eaſe;
For me the ploughman turns the ſtubborn ſoil;
For me the lawyers plead, and courtiers ſmile.——
But tho' I'm thus careſs'd by all the ſtate,
I've much endur'd, and hard has been my fate:
There is a cavern, horrid and profound,
Where waters roll and darkneſs reigns around,
There for a ſeaſon I cloſe priſoner lie,
Without relief, without one pitying eye.
Next to a furnace am I doom'd to go,
Like Shadrack, Meſhach, and Abednego:
From thence with greater merit I aſcend,
The idiot's idol, and the wiſe-man's friend;
With harden'd face again behold the day,
And baniſh all my former woes away.

VI. Enigma 653, by Eugenio.

Ladies, an annual ſervant of the fair,
Begs leave in your fam'd Di'ry to appear.
My ſhape is various, ſometimes ſquare I'm found,
Again I'm neither oval, ſquare, nor round.
Sometimes you find me plain in ev'ry part,
Yet oft'ner beautify'd with niceſt art.
By me the youthful ſwains do oft declare
Their tender paſſion for the blooming fair;
The blooming fair by me, in ſofteſt ſtrains,
Expreſs their kindneſs for the youthful ſwains:

Thus to each ſex my mutual aid I lend,
And to both ſexes prove a faithful friend:
Faithful indeed! for ne'er do I reveal
Thoſe things I'm order'd cloſely to conceal,
Till ſome rude hand my tender boſom tear
By force, and find the hidden ſecret there.
Whole nights I trembling wait without your door,
While rain deſcends, and dreadful tempeſts roar;
Nor heed I whiſtling winds or beating rain,
So I at length a ſafe admittance gain.——
My fate is various — Sometimes I'm careſt,
And fondly to your gentle boſoms preſt;
Sometimes neglected, trampled in the mire,
Or, dreadful torture! in the flames expire.

VII. ENIGMA 654, by Mr. Richard Pidgley.

Ladies, I, your uſeful ſervant,
Oft ſalute your lilly hands;
Both to ſuccour and defend you,
Introduc'd from foreign lands.

My appearance firſt was ſtriking,
Now I'm more familiar grown,
Almoſt now in general liking,
In particular your own.

Proteus like, my ſhape I vary,
Frequent change my colour too,
If it pleaſe my miſtreſs Mary,
I am yellow, green, or blue.

Yet with all this gay appendage,
Ladies you yourſelves muſt own,
At my higheſt, beſt perfection,
I am meerly ſkin and bone.

Still, tho' ſuch a ſpright to ſee to,
You receive me in your arms,
Where my chiefeſt pride and glory's
The protection of your charms.

When remov'd from exaltation,
Oft I find a place of reſt,
By a kind of transformation,
Underneath your flowing veſt.

VIII. ENIGMA 655, by Mr. Rob. Richardſon.

Behold us two brethren faſt coupled for life;
Or, if ſimilies hold, call us huſband and wife;
Tho' not really tied, yet together we dwell,
And a bad wife am I if the truth I muſt tell;
For I joſtle and ſtrike, and full often knock down
The beſt-natur'd huſband you ever have known:
Yet from quarrels domeſtic no miſchiefs enſue,
Tho' Dolly and Suſan our actions review;
For they ſmile at my courage, and call it a ſpell,
Colds, agues, and fevers, and death to repel.
But, view us in public, I bluſh to relate
What dreadful diſaſters we daily create:——
The poor hapleſs orphan, maid, widow and wife,
I furniſh with grief for each moment of life.
Suppoſe now before you, my huſband and I,——
I ſwagger, and bluſter, and at him I fly;
A train of black imps who were waiting the fray,
To a gang of confed'rates the news bear away:
In a cavern as dark as Cyrene e'er trod,
The wretches had ta'en up their lonely abode;

But now, inſtantaneous, like light'ning they fly,
Unite in a body, and dart thro' the ſky;
Scatter death and deſtruction and horror around,
Then vaniſh in air, and no more can be found,

IX. Enigma 656, by Mr. Henry Lee.

When chearful goſſips crowd the jovial bowl,
And wine with friendſhip captivates the ſoul,
Lo oft I come, with all my dear-lov'd train,
And oft you'll view me on the verdant plain;
There with my brethren, ſubjects muſt I ſay?
We, putian like, at ſportive gambols play.
Tho' I the leaſt of all my number'd train,
Yet ſtill the power predominant maintain:
Oft o'er the king with ſov'reign pomp I ſway,
And at my nod my ſubjects all obey,
Tho' ten to one attack me in the fray.
Except, by contract ſhould ſome knave aſſume,
By cuſtom fix'd, to rob me of my bloom,
Devoid of fear the bold intruder comes,
With preſence black as Africk's tawny ſons,
Then, tyrant like, he with deſpotic ſway
Bears rule, and I alas! am doom'd t'obey.

X. Enigma 657, by Mr. Thomas Roberts.

Ye faithful vot'ries of platonic love,
Whoſe panting hearts in quick vibrations move,
And you ſad vot'ries of oppreſſed grief,
Behold a gentle, eaſy, ſwift relief;
Mild is its nature; 'tis a child of care;
And fervent as the ſummer's noontide air.
Its eath nativity is ſcarcely known,
Ere, like the ſilent ſhades of night 'tis gone;
Gone in the inſtant, quite diſſolv'd away,
As loſt Diana in the ſolar ray.—
When ſummer ſuns emit their fervent blaze,
And drown all nature in reſplendent rays,
The rural ſhepherd ſeeks th' umbrageous ſhade,
And ardently invokes th' dear-lov'd maid:
'Tis now the Meliæ trip it o'er the green,
And ſportive Dryades glide along unſeen;
And now whilſt love incites the melting tale,
Soft Zephyrs gently waft it down the vale.
Should you deſire to know its genuine pow'r,
Bid Ægon ſpeak the tranſport of the bow'r,
When fair Monimia, charmer of all charms,
O'ercharg'd with love, ſunk in his folded arms.
And hear unhappy Amoret relate,
Expiring Roſalind's unhappy fate;
"Behold! he cries, the tears faſt ſtreaming down,
Behold in us two marks of fortune's frown!
A dying nymph oppreſs'd with more than pain,
A hapleſs, ruin'd, broken-hearted ſwain!"
Such ſtriking ſcenes as theſe its influence prove,
Scenes of moſt pungent grief and pureſt love.
But oft in vain its utmoſt efforts are,
To vent the ſhepherd's woe, or eaſe the fair.

XI. Enigma 658, by Mr. M. Applin.

My author, ambitious once more to engage,
And caſt in his mite to Diana's page,
Preſents his devoirs to the ſmart and the witty,
And, by your permiſſion, entreats me to greet ye:
He vows, for you ladies, no man upon earth
Has greater eſteem, nor more values your worth;
Nay raiſes your merit quite up to the ſkies;
But don't believe all, as I ſometimes tell lies:
Yet think not my preſence is any diſgrace,
My lord at his table allows me a place;
In elegant dreſs there with ſplendor I ſhine,
And gain moſt applauſe when aſſiſted by wine.
The peaſant will have me oftimes by his fire;
Then aukward indeed, and quite mean my attire.
But leaſt you miſtake me for what I am not,
As I preſently cool, therefore pray take me hot;
And pay due attention whilſt this I unfold,
Your ſmiles can attract, tho' an hundred years old:
Yet when in my prime, I ſtill pleaſe you the beſt,
And engage your eſteem if I'm decently dreſs'd.
I ſometimes am round, at the ſame time am flat;
But when I am ſharp, I gain credit for that.
'Tis odd I confeſs ſuch a whim ſhou'd prevail,
Yet all like me beſt with a ſting in my tail.

XII. (or Prize) Enigma 659, by Mr. Wm. Jones, of Heyford.

Behold a fav'rite, o ye ſprightly fair,
A lov'd attendant thro' the varying year,
Grown bold by favours now attempts to gain
A vacant niche in Dia's myſtic fane.
Sing then, ye muſes, all my charms proclaim,
In ſtrains as loud, as laſting, as my fame;
Bid youthful artiſts mark the quaint deſign,
And riſing genius beam in ev'ry line;
Let Albion's nymphs with admiration ſee,
What beauteous ornaments embelliſh me.——
Here love's ſoft goddeſs, ſtill to grief a prey,
Oe'r lov'd Adonis weeps the hours away;
Bathes ev'ry wound, deſpoils her golden hair,
Depicting well the ſtatue of deſpair:
Here chaſte Diana with her virgin train,
Purſues Acteon o'er the ſteril plain:
Here Procris, hid in ambuſh, mourns too late,
The fatal ills which jealouſy await;
Here Atalanta flies before the wind,
And leaves the wretched lover far behind:
Here winding ſtreamlets ever ſeem to flow,
And laſting flow'rets on the margins blow.
But, ah! deſcriptions vain — now turn your eyes,
And ſee my worth in ten-fold ſplendor riſe.
To give you pleaſure, o ye fair, 'tis known,
I veil your charms, and oft expoſe my own.
When Damon's eyes his ardent love diſcloſe,
I meet their ſoftneſs, and each glance oppoſe;
While you exulting may in ſecret view
The pungent grief that rends his heart in two;
Yet in return the love-ſick ſwain may tell,

What raging paſſions in your boſoms dwell;
Love, envy, anger, all the horrid train,
By well known motions I with eaſe explain.
When old Avarro left his charmer's bed,
To hide the tears ſhe ſhed, or ſeem'd to ſhed,
The youthful mourner ſought my needful aid,
To make complete her ſable maſquerade.
With gay Flirtilla practice ev'ry art,
Repel, attract, and captivate the heart;
With voice tremendous each attack defy,
Whilſt troops of beaux in wild diſorder fly;
With magic touch recal the wand'ring youth,
To ſue for pardon, vow eternal truth.——
When o'er the cheek a pallid hue is ſpread,
The ſpirits droop, and active life has fled;
My pleaſing efforts quickly interpoſe,
And oft reſtore Hygiæa's blooming roſe;
While my lov'd offſpring on your boſoms play,
Pant on your lips, and ſigh themſelves away.

⁂ ERRATA *in* VII *Eng.* 643, *by Mr. Jones, laſt year, viz. lines* 27 *and* 28 *ſhould be*

Yet I'm at beſt a light fantaſtic toy,
Which ſmiles create, and ſullen frowns deſtroy.

NEW REBUSES and QUERIES.

I. REBUS, by Elvira.

The king who firſt the uſe of honey found,
And he the ſcorpion gave a mortal wound;
A noble beaſt that verdant lawns ne'er rov'd;
Th' Arcadian nymph by Neptune much belov'd;
If you theſe initials will join, they'll quickly explain,
What's oftentimes known a falſe lover to gain.

II. REBUS, by Mrs. B. of Saliſbury.

A uſeful beaſt, eſteem'd by all,
Producing food for great and ſmall;
A ſhelter ſlight in much repute;
A flower once emblem of diſpute;
A dainty priz'd at city feaſt;
Two countries known by weſt and eaſt;
A man of fame, in holy writ,
Therein enroll'd for riddling wit:
Th' initials join, they'll ſurely name
A Wiltſhire hero, moſt humane.

III. REBUS, by ?

To an evergreen tree juſt fifty unite,
And to them join two-thirds of the organ of ſight,
The author they'll ſhew who this rebus did write.

IV. REBUS, by Mr. John Stafford.

Two fives join together; two fifties place near;
Divide them by one; and there'll quickly appear
A thing in which many their mind do declare.

V. REBUS, by Miſs Roſebud.

Half of that place where man was firſt afraid,
Five hundred, and a uſeful quadrupede;
Join theſe together, and you'll thus obtain
A myſtery not eaſy to explain.

VI. Rebus, by Miſs Emilia Rivers.

Half a cardinal ſam'd for ambition and pride;
And half of what hats oft are made;
A Britiſh commander they'll give to your view,
Crown'd with laurels that never can fade.

A Paradox, by Hilaria.

Mathematicians affirm that, of all bodies contained under the ſame ſuperficies, a ſphere is the moſt capacious: but ſurely they have never conſidered the amazing capaciouſneſs of a body whoſe *name* is now required, and of which it may be truly affirmed, that ſuppoſing its greateſt length 9 inches, greateſt breadth 4 inches, and greateſt depth 3 inches, yet under theſe dimenſions it contains a ſolid foot.

I. Query, by Mr. J. Jackſon.

It is generally believed, that bells are hung as high in the ſteeple as they conveniently can, for the ſake of being heard the farther off. Now it has been obſerved, that thoſe on a hill are not heard ſo far as thoſe on a plain; and generally the higher they are hung, to the leſs diſtance they are heard. How is this to be accounted for.

II. Query, by Mr. John Bayley, of Middleton, Yorkſhire.

Why do pieces of ſtone, ſlate, wood, &c. look of a darker colour when wet, than when dry; tho' the water thrown on them ſhall be clear, and conſequently of no colour? And why do ſmall pebbles found on the ſea-ſhore, &c. appear more tranſparent when wet, than when dry?

III. Query, by Mr. Richard Willet.

Chandler ſays, in his Travels, pa. 13, "We were now (A. D. 1765) amuſed by a very ſtriking phænomenon — the ſun was ſetting; and the moon, now riſing in the oppoſite or eaſtern edge of the hemiſphere, was adorned with the beams of that glorious luminary, which appeared not as uſual, but inverted, the ſharp end pointing to the horizon, and the ray widening upwards." This I myſelf obſerved, with ſome ſurprize, on the evening of the 30th of October 1781—and could wiſh to know what reaſon can be aſſigned for ſuch phænomenon.

IV. Query, by The Poet Laureate.

Is the preſent inſtitution of Poet Laureate derived from the office of king's jeſter? Or, if not, what elſe was the origin of it?

⁂ *The number of prizes are eight, to be determined by lot, viz. one of 10 and one of 8 diaries for the ſolutions of the prize-enigma; two of 10 diaries each for the general ſolutions of the enigmas; two of 8 diaries each for the ſolutions of the queries and rebuſes; alſo one of 12 and one of 8 diaries for the ſolution of the prize-queſtion. The competitors for the prizes given for the ſolutions of the prize enigma and prize queſtion, muſt ſend their letters, containing thoſe ſolutions, before Candlemas day; and all other letters for the uſe of the Diary, muſt be ſent before the 1ſt of May. — Our correſpondents are requeſted to make their compoſitions as ſhort as poſſible with propriety; as many are unavoidably omitted from their too great length. They are not however always to conclude that their pieces are rejected when they do not ſee them inſerted preſently after they are ſent, becauſe they are often kept back for ſeveral years, thro' the great number that come to hand, that we may give every one his turn.—Solutions to be ſent with all new propoſitions.*

ANSWERS to the MATHEMATICAL QUESTIONS.

I. Queſtion 803 anſwered by Amicus.

THE firſt equation being divided by the ſecond, and w made $= \frac{y}{x}$, we have $w \times \frac{1 - w^2}{1 + w^2} = \frac{24}{85} = \frac{3}{5} \times \frac{8}{17} = \frac{3}{5} \times \frac{1 - \frac{9}{25}}{1 + \frac{9}{25}}$, where 'tis evid. that $w = \frac{3}{5}$, and $x^4 = \frac{3481600}{1 + w^2}$ by the ſecond given equa. conſeq. $x = 40$, and $y = 24$. But the equa. above, or which is the ſame $\frac{24}{85} + \frac{24}{85} w^2 - w + w^3 = 0$, has alſo another real root affirmative; for, divided by $w - \frac{3}{5}$, it gives $w^2 + \frac{15}{17} w - \frac{8}{17} = 0$, $w = \frac{\sqrt{769} - 15}{34} = \text{·}3744372$, $x = 41\text{·}79427$, and $y = 15\text{·}64935$; which alſo anſwer the conditions of the queſtion.

The ſame anſwered Mr. L. Evans.

Subſtitute zx for y in the given equations, and they become $x^4 z - x^4 z^3 = a$, and $x^4 + x^4 z^2 = b$; conſeq. $x^4 = \frac{a}{z - z^3} = \frac{b}{1 + z^2}$; hence $z^3 - \frac{a}{b} z^2 - z = -\frac{a}{b}$, the root of which is $\frac{3}{5}$. Hence $x = 40$, and $y = 24$.

Lovely Sue! Richard and his pelf poſſeſs,
From love *alone* reſults no happineſs.
Quia, - - - - - Sine Cerere & Baccho friget Venus.

But moſt of our correſpondents recommend the fair to make choice of the younger lover; and ſome adviſe her to chuſe him whom ſhe loves beſt, which is indeed the advice ſhe will be moſt likely to follow. Ingenious anſwers were alſo given by Meſſrs. *Adams*, *Aſhburner*, *Bartlett*, *Bewley*, *Bownas*, *Chamberlain*, *J. Clarke*, *Dalton*, *Dening*, *Dowden*, *J. Fletcher*, *French*, *Herod*, *Knowles*. *Leedham*, *Robinſon*, *Roſs*, *Rowe*, *Scott*, *Sharp*, *Terril*, *Treleaſe*, *Walton*, *White*, *Whitton*, *Williams*, *Wood*, *and Young*.

⁂ The propoſer's name to this queſtion laſt year was miſprinted Wilſon inſtead of Williams.

II. Queſtion 804 anſwered by Mr. John Scott, of Woolwich.

FROM the principles of mechanics, it is evident that the revolution of the great wheel in one hour will be expreſſed by $48 \div 12 \times 12$ or $\frac{1}{3}$; and that of the crown wheel thus $1 \times 72 \times 60 \div 3 \times 8 \times 5 = 36$: now as the pendulum vibrates ſeconds, the number of teeth in the crown wheel will be expreſſed thus $60 \times 60 \div 36 \times 2 = 50$, as required.

The ſame anſwered by Mr. George Bewley.

As the great wheel moves round once in 12 hours, the crown or pallet wheel, by the data, muſt move round $9 \times 12 \times 4 = 432$

times in 12 hours, or once in 100 ſeconds. Now a pendulum of the given length vibrating ſeconds, and the crown wheel advancing one tooth in two vibrations, we have $100 \div 2 = 50$ for the number of teeth in the new crown wheel.

The ſame by Mr. L. Evans

Let A, B, and C repreſent the given wheels, acting upon a, b, and c, their contiguous pinions; alſo let $v =$ the number of vibrations of the given pendulum in 12 hours, and $x =$ the ſwing wheel ſought. Then, by ſect. 1. chap. 2. of the Artif. Clock Maker,

$$\frac{ABC}{abc} \times 2x = v: \text{ hence } x = \frac{abcv}{2ABC} = 50 \text{ the anſwer.}$$

Ingenious anſwers were alſo given by Meſſrs. *Amicus*, *Aſhburner*, *Bartlett*, *Bownas*, *J. Clarke*, *Fletcher*, *French*, *Jackſon*, *Knowles*, *Rowe*, *Terril*, *Walch*, and *Whitton*.

III. Queſtion 805 anſw. by Mr. J. Clarke, of Sa'ford School.

IT is a well-known theorem (and eaſily demonſtrated) that the diameter of a circle inſcribed in the common parabola, is equal to the difference between the parameter and the greateſt double ordinate. Therefore putting x to denote the abſciſs of the required parabola, we have from the given area, $\frac{9000}{x} =$ the param. and $\frac{300}{x}$ the ord. hence $\frac{300}{x} - \frac{45000}{x^3}$, the radius of the inſcr. circle, muſt be a maximum; this being fluxed and reduced, there ariſes $x = \sqrt{450} = 15\sqrt{2} =$ the abſciſs of the required parabola; and conſequently, $10\sqrt{2} =$ the ſemibaſe, and $\frac{20}{3}\sqrt{2} =$ the radius of the inſcribed circle; that is 21·213203, and 14·14213, and 9·42809, reſpectively.

Ingenious ſolutions were alſo given by Meſſrs. *Adams*, *Amicus*, *Bartlet*, *Bewley*, *Bownas*, *Brinkley*, *Dalton*, *Evans*, *Fletcher*, *French*, *Knowles*, *Robinſon*, *Rowe*, *Sharp*, *Terril*, *Treleaſe*, *White*, *Whitton*, *Wood*, *Young*, and *Ja. Williams*, which laſt gentleman adds theſe corollaries, drawn from his ſolution, viz. 1, that the greateſt or bounding ordinate of any parabola is equal to the diſtance on the axis between that ordinate and another ordinate drawn from the point of contact of the inſcribed circle. 2, that the radius of the greateſt circle that can be inſcribed in a parabola whoſe area is given, is equal to the parameter of the parabola. 3, That the ordinate to the axis drawn from the point of contact, biſects the radius of the circle on the axis. And 4th, that the parameter, ordinate, and abſciſs, of a parabola having its area given and its inſcribed circle a maximum, are reſpectively as the numbers 4, 6, 9.

IV. Queſtion 806 anſwered by Mr. Joſeph French.

MULTIPLYING the latter ſeries, or that of even terms, by $\sqrt{2}$, we have $\sqrt{\frac{1}{1}} + \sqrt{\frac{1}{2}} + \sqrt{\frac{1}{3}} + \sqrt{\frac{1}{4}} + \sqrt{\frac{1}{5}} + \sqrt{\frac{1}{6}}$ &c. which is evidently the ſum of both the two ſeries. Putting therefore for ſhortneſs,

a for the former ſeries, and b for the other, we ſhall have $b\sqrt{2} = a + b$; hence $b\sqrt{2} - b = a$, and $a : b :: \sqrt{2} - 1 : 1$. *Q. E. D.*

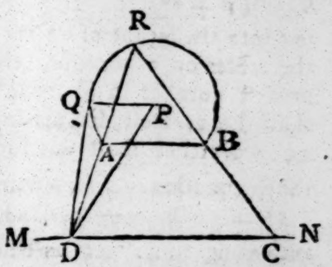
Corol. In like manner it may be ſhewn in general that $1 + \frac{1}{3^n} + \frac{1}{5^n}$ &c. $: \frac{1}{2^n} + \frac{1}{4^n} + \frac{1}{6^n}$ &c. $:: 2^n - 1 : 1$. And here while n is greater than 1, then $2^n - 1$ is greater than 1;
when n is $= 1$, than $2^n - 1$ is $= 1$; and
when n is leſs than 1, then $2^n - 1$ is leſs than 1:
And accordingly the firſt ſeries is greater, equal, or leſs than the ſecond ſeries, reſpectively as n is greater, equal, or leſs than 1.

The ſame by Mr. James Clarke, of Salford School.

If we divide the firſt or whole ſeries by $\sqrt{2}$, the reſult will evidently be $\sqrt{\frac{1}{2}} + \sqrt{\frac{1}{4}} + \sqrt{\frac{1}{6}}$ &c. (the terms in the even places): conſequently it will be as $\sqrt{2} : 1 :: \sqrt{\frac{1}{1}} + \sqrt{\frac{1}{2}} + \sqrt{\frac{1}{3}}$ &c. $: \sqrt{\frac{1}{2}} + \sqrt{\frac{1}{4}} + \sqrt{\frac{1}{6}}$ &c. and therefore (dividendo) $\sqrt{2} - 1 : 1 :: \sqrt{\frac{1}{1}} + \sqrt{\frac{1}{3}} + \sqrt{\frac{1}{5}}$ &c. $: \sqrt{\frac{1}{2}} + \sqrt{\frac{1}{4}} + \sqrt{\frac{1}{6}}$ &c. *Q. E. D.*

Nearly in the ſame manner was the anſwer given by Meſſrs. *Amicus*, *Bewley*, *Brinkley*, *Fletcher*, *Lean*, *Knowles*, *Rowe*, *Terril*, *Treleaſe*, *White*, *Whitton*, *Wood*, *and Young*.

V. Queſtion 807 anſw. by the Propoſer, Mr. John Brinkley.

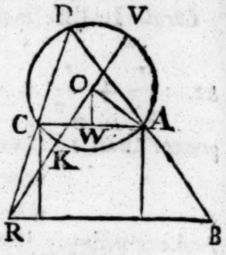


CONSTR. Draw the right line AB equal the ſide of the given inſcribed ſquare, on which deſcribe the circular ſegment ARB to contain the given vertical angle; and parallel to AB draw MN ſo that the diſtance of AB and MN may be equal AB. From P the center of the circle ARB apply PD ſo that $PD^2 =$ given rectangle $+$ the ſquare of the radius of the circle ARB; then from D thro' A draw DR to meet the circumference of the circle in R; and from R thro' B draw RC to meet MN in C. So ſhall DRC be the triangle required.

DEMONSTR. Draw the tangent DQ to the circle, and join PQ. Now ſince $DP^2 = PQ^2 + DQ^2$, and alſo $DP^2 = PQ^2 +$ given rectangle (per conſtr.), therefore $DQ^2 =$ the given rectangle. But (per prop. circle) $DR \cdot DA = DQ^2$; conſeq. $DR \cdot DA =$ the given rectangle. All the reſt is evident.

Nearly in the ſame manner was the conſtruction given by Meſſrs. *Amicus*, *Beck*, *Bewley*, *Bownas*, *J. Clarke*, *Cockerhill*, *Fletcher*, *French*, *Hampſhire*, *Hellins*, *Knowles*, *Parnel*, *Sanderſon*, *Treleaſe*, *White*, *Whitton*, and *Wood*.

An Algebraic Solution by Mr. John Fletcher.



Suppoſe RDB to be the required triangle, AC the ſide of the inſcribed ſquare, O the center of the circle deſcribed thro' A, C, D; alſo OW $\perp$ AC, &c. Then ſince AW $= \frac{1}{2}$ AC, the angle AOW $= \angle$ D, and is therefore given, as well as AW; conſeq. the hypothenuſe, or radius of the circle, OA is alſo given. Put therefore $r =$ OA $=$ OV $=$ OK, $a =$ AC, $m^2 =$ the given rectangle, and $x =$ OR. Then CR.RD $=$ VR.RK $= m^2 = \overline{x+r}\,.\,\overline{x-r} = x^2 - r^2$. Therefore $x = \sqrt{m^2 + r^2}$.

Algebraic ſolutions were alſo given by Meſſrs. *Adams*, *J. Clarke*, *Dalton*, *Evans*, *Robinſon*, *Rowe*, *Sharp*, *Terril*, and *Young*.

VI. Queſtion 808 anſwered by Amicus.

THE aſcenſional difference is given by the queſtion $= 30°$, whoſe ſine is $= \frac{1}{2}$; and, by ſpherics, as $\frac{1}{2}$ or ſine of the aſc. dif. : 1 : : t the tang. of the declin. : $2t$ the cotangent of the latitude, the ſine of which is therefore $\overline{1 + 4t^2)}^{-\frac{1}{2}}$; and the coſine of twice the declin. $=$ coſine of the altitude $= \frac{1 - t^2}{1 + t^2} : \frac{1}{\sqrt{1 + 4t^2}} : : 8 : 9$ per queſt. that is $\frac{8}{9} = \frac{1 - t^2}{1 + t^2}\sqrt{1 + 4t^2} =$ the coſine of double the arc whoſe tangent is t into the ſecant of an arc whoſe tangent is $2t$; whence, by comparing the tables or otherwiſe, the value of t comes out ·4542253, and the neareſt number in Sherwin's table is 24° 25′ or 24° 26′, being greater than the greateſt declination poſſible; and $2t$ gives the latitude $= 47°$ 45′. Neither ſhall we ſucceed any better by ſeeking the roots of the above equation. For putting the ſecant $\sqrt{1 + 4t^2} = s$, we get $s^3 + \frac{8}{9}s^2 - 5s + \frac{8}{3} = 0$, and the greateſt affirmative root $= 1{\cdot}3510299$, anſwering to 47° 45′ as before; and the other is ·676753, which, being leſs than radius 1, is impoſſible, as is likewiſe the 3d root which is $= -2{\cdot}9172609$.

The ſame by the Propoſer Mr. Alex. Rowe.

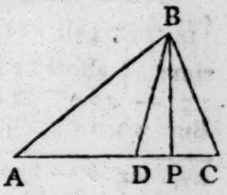
Let $x =$ ſine of the latitude; then by ſpherics $1 : \frac{1}{2} : : \frac{\sqrt{1 - r^2}}{x}$ (cot. lat.) $: \frac{\sqrt{1 - x^2}}{2x} =$ tang. declin; and by the nature of ſines, &c. the coſine of double the declin. or the coſine of the alt. will be $\frac{5x^2 - 1}{3x^2 + 1}$; theref. $\frac{5x^2 - 1}{3x^2 + 1} : x : : 8 : 9$; hence $24x^3 - 45x^2 + 8x + 9 = 0$; which ſolved gives 47° 4′ for the lat. and hence 24° 26′ the declin. which is too great, as the greateſt declin. is now only 23° 28′: which was owing to the ratio of 8 to 9 being taken too great. But if it be taken 10 to 11, the equation will become $30x^3 - 55x^2 +$

$10x + 11 = 0$, the root of which is $x = \cdot 7600158$ the ſine of 49° 28′ the lat. and hence the declin. is 23° 9′, anſwering to the 11th of June.

The ſolution was given nearly in the ſame manner by Meſſrs. *Adams*, *Bewley*. *H. Clarke*, *Evans*, *Fletcher*, *Hellins*, *Knowles*, *Parnel*, *Robinſon*, *Sharp*, *Terril*, *Treleaſe*, *White*, *Whitton*, *Williams*, *Wood*, and *Young*.

VII. Queſtion 809 anſwered by Amicus.

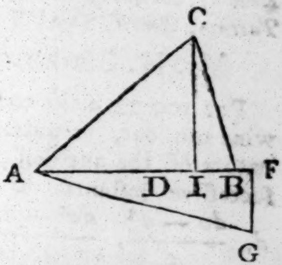
PRODUCE the given diff. AD of the ſegments of the baſe till the rectangle ACD = the ſquare of the given ſide + the given diff. of the ſquares of the other two, then make DB = CB = the given ſide, and draw AB; ſo ſhall ABC be the required triangle.



For letting fall the perp. BP, we have $AB^2 - BC^2 = AP^2 - PC^2 =$ rect. DAC, theref. rect. $ACD = AC^2 - DAC = AC^2 - AB^2 + BC^2 =$ (by conſtr.) $BC^2 +$ the given diff. of the ſquares of the other two ſides; take away BC^2 common, and $AC^2 - AB^2 =$ their given difference. *Q. E. D.*

The ſame by Mr. Robert Bownas.

On any line take $AF = AC$ the given ſide, and raiſe $FG \perp AF$ and $= D$ the ſide of a ſquare equal the given dif. of the ſquares of the other two; draw AG, then (by Simp. Geom. V. 18) take AB ſuch that the rect. $AB.\overline{AB + AD} = AG^2$, AD being the given dif. of the ſegments; biſect BD with the perp. IC, apply AC, and draw BC, ſo ſhall ABC be the required triangle.



Demonſtr. AC = the given ſide, and AD = the given dif. of ſeg. by conſtr. ſo it only remains to prove that $AB^2 - BC^2 = D^2$. In order to which, $AB.\overline{AB + AD} = AG^2 = AF^2 + FG^2 = AC^2 + D^2$, or $AB^2 + AB.AD = AC^2 + D^2$; but by the triangle, $AC^2 - BC^2 = AB.AD$, theref. $AB^2 - BC^2 = D^2$.

Various other ingenious conſtructions were given by Meſſrs. *Aſpland*, *Beck*, *Bewley*, *Brinkley*, *H. Clarke*, *Cockerbill*, *Fletcher*, *French*, *Hampſhire*, *Knowles*, *Parnel*, *Sanderſon*, *White*, *Whitton*, and *Wood*.

An Algebraic Solution by the Rev. Mr. John Hellins.

Put $a =$ the given ſide, $bb =$ the dif. of the ſquares of the other two, $d =$ the dif. of the ſegments, $x =$ the baſe, and $y =$ the other ſide: Then $y^2 - a^2 = \pm dx$ by Eucl. III. 36, and $x^2 - y^2 = \pm b^2$ per queſt. from which equations we get $x^2 \mp dx = a^2 \pm b^2$, an equation which exhibits all the four caſes of this problem.

Obſerv. 1. Since, by the conditions of the queſtion, d can never be greater than x, it is evident that the leaſt value of $x^2 - dx = a^2 - b^2$, is 0; or that, in this caſe, b muſt not be given greater than a.

Obſerv. 2. Since $x^2 + dx$ can never be leſs than $2d^2$, this is the leaſt value of $a^2 - b^2$ in that caſe.

Algebraic ſolutions were alſo given by Meſſrs. *Adams*, *Bewley* *J. Clarke*, *Dalton*, *Evans*, *Fletcher*, *Robinſon*, *Roſs*, *Rowe*, *Sharp*, *Tattam*, *Terril*, *Williams*, and *Young*

VIII. Queſtion 810 anſwered by Mr. James Young.

Let x be the gallons of wine left in the caſk after t ſeconds. Then a (10″) : 1 gal. :: $\dot{t}$: $\dot{t}a^{-1}$ = the gallons of mixture run out in the time $\dot{t}$; alſo b (100) : $\dot{t}a^{-1}$ :: x : $-\dot{x}$, theref $\dot{t}x = -ab\dot{x}$, or $\dot{t} = -abx^{-1}\dot{x}$; and the fluents are $t = -ab \times$ hyp. log. x. But when $t = 0$, $x = b$, therefore the correct fluents are $t = ab \times \overline{\text{hyp. log } b - \text{hyp. log. } x}$; conſeq. hyp. log. x = hyp. log. $b - \frac{t}{ab}$ = hyp. log. 100 — 3·6 (t = 1 hour = 3600″ per queſt.) = 1·0051702 the number to which hyp. log. is x = 2.73237 gal. = the wine left in the caſk.

Cor. All the wine will never be run out; for when $x = 0$, t is infinite.

Almoſt in the ſame words is the ſolution given by Meſſrs. *Amicus*, *Bewley*, *Brinkley*, *H. Clarke*, *Fletcher*, *French*, *Hellins*, *Knowles*, *Rowe*, *Tattam*, *Terril*, *Todd*, *Treleaſe*, *White*, *Whitton*, and *Wood*.

Mr. H. Clarke alſo anſwered it otherwiſe, as follows:

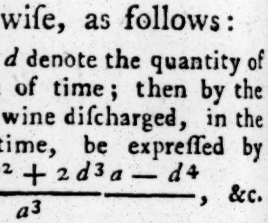
Put 100 = a the content of the caſk, and let d denote the quantity of wine run out, or water run in, the firſt inſtant of time; then by the nature of the queſtion, will the quantities of wine diſcharged, in the ſucceſſive inſtants, or indefinite particles of time, be expreſſed by

$$d,\ \frac{da - d^2}{a},\ \frac{da^2 - 2da + d^3}{a^2},\ \frac{da^3 - 3d^2a^2 + 2d^3a - d^4}{a^3},\ \&c.$$

the ſum of which ſeries continued to an indefinite number (n) of terms, is $\overline{a^n - \overline{a - d}|^n} \times a^{1-n}$; which is therefore an approximate expreſſion for the whole quantity of wine diſcharged;—where the greater n is taken, the nearer the truth will it approach. Suppoſe $n = 3600$ (the ſeconds in 1 hour, the given time), then will $d = \cdot 1$, and conſequently $\overline{a^n - \overline{a - d})^n} \times a^{1-n} = 97{\cdot}27$ gallons, therefore 2·73 gallons is the quantity of wine remaining in the caſk.

And nearly in both theſe ways alſo did Mr. *Whitton* give ſolutions.

IX. Queſtion 811 anſwered by Mr. John Whitton.



THE fig. being deſcribed as directed, draw CQF. Then, becauſe of the parallels LO, AD, we have AF : FB :: LQ : QO :: AB : BD; but AB and BD are both given, and therfore both the ratio of LQ to QO and of AF to FB are given or conſtant. And conſeq. the locus of Q is the right line CF dividing AB in the given ratio of AB to BD: and that whether the angles ABC, ACD be right angles, as in the queſtion, or of any other magnitudes.

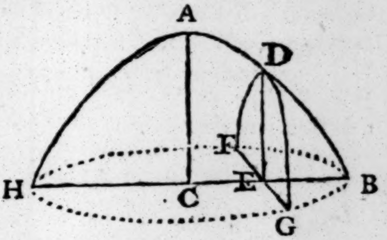
Amicus, after a ſimilar demonſtration and remark, alſo farther obſerves that, if EF be drawn cutting LO in N, then becauſe the ratio of

LQ : QN or AB to BF is given, the locus of the point N is a right line CP paſſing through C, and the line AD is ſo divided that BD : BA : : FB : FA : : PF : PA &c. and the line LM is divided in O, Q, N in the ſame manner.

And Mr. *George Beck* renders the prob. ſtill much more general; for having as above found AB : BD : : LQ : QO, he infers that therefore the locus of Q will be a line of the ſame order with the line BOC when AE is any right line given in poſition, and BE and DE right lines inflected to it, and moving around from the two poles B and D; ſo that if BOC be a right line, then the locus of Q will be a right line; if that be a conic ſection, ſo will this; and if the former be a line of the *n*th order, ſo alſo will the latter. And farther, that if BOC be a right line, and AE any curve, the locus of Q will alſo be a curve of the ſame order. And this he illuſtrates by ſome examples, but the ſubject is too copious for the limits of the Diary.

The demonſtration of this property was alſo given by Meſſrs. *Adams*, *Bownas*, *Brinkley*, *H. Clarke*, *Cockerbill*, *Fletcber*, *Glenie*, *Knowles*, *Parnel*, *Rowe*, *Sanderſon*, *Terril*, *White*, *Williams*, *Wood*, and *Young*.

X. Queſtion 812 anſwered by the Rev. Mr. John Hellins.

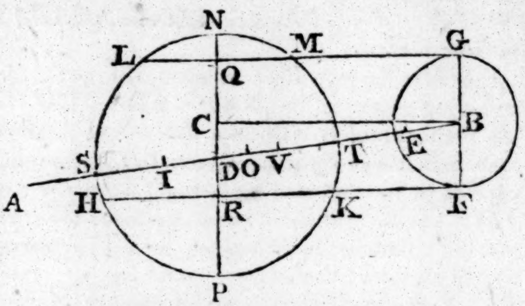


LET ABH repreſent the hyperboloid, and EFDG a vertical ſection of it. Put AC = 8 = a, 200 lb. = b, CB = CH = 5·729579 = r, DE = x, and EF = EG = y. Now by the queſt. $a : b : : x : a^{-1}bx$ = the denſity at E; in like manner the denſity at any other point in FG will be $a^{-1}b \times$ the perp. height above it; and as all theſe perpendiculars make up the area of the parabola FDG, theref. the ſum of the denſities in the whole line FG will be $= a^{-1}b \times$ area FDG $= a^{-1}b \times \frac{4}{3}xy$; conſeq. the flux. of the value of all the denſities in FDG will be $\frac{4}{3}a^{-1}bxy\dot{x} = \frac{8}{3}abr^{-4}y^4\dot{y}$, the fluent of which gives $\frac{8}{15}abr^{-4}y^5$ for all the denſities in FDG; and this drawn into the fluxion of BE or of $-\sqrt{r^2-y^2}$, gives $\frac{8aby^6\dot{y}}{15r^4\sqrt{r^2-y^2}}$ for the fluxion of the weight of the ſlice BDFG; the fluent of which, or the weight of that ſlice will be $\frac{1}{6}abr \times \text{BG} - \frac{15r^4+10r^2y^2+8y^4}{90r^4} \cdot aby\sqrt{r^2-y^2}$: And in the preſent caſe, in which $x = \frac{1}{2}a$, or $y^2 = \frac{1}{2}r^2$, and BG is $\frac{1}{2}$ a quadrant, this expreſſion becomes $\cdot7854 - \frac{11}{15} \times \frac{1}{6}abr^2 = 455\cdot78$ lb. the weight of the ſlice.

And when $y = r$, the ſame expreſſion becomes $\cdot7854 \times \frac{1}{3}abr^2 = 13750\cdot99$ for half the weight of the ſolid, the double of which or 27501·98 lb. is the weight of the whole paraboloid.

True ſolutions to this queſtion were alſo given by Meſſrs. *Amicus*, *Brinkley*, *Clarke*, *Fletcber*, *Hartley*, *Knowles*, *Parnel*, and *Terril*. Beſides falſe anſwers by many others.

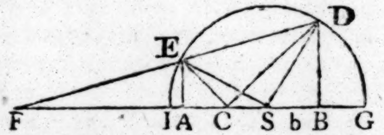
XI. Queſtion 813 anſwered by Mr. John Hampſhire.



CONSTR. Join the centers B, D of the given circles, and on BD produced take SA, SI, TV, TE each equal the radius BG of the leſs circle, ſo that AE is the ſum of the two given diameters, which cut in O (by prob. 7. Wales's Determinate Sect.) ſo that $OI . OE : OV . OA :: m^2 : n^2$ the duplicate of the given ratio. With the hypothenuſe DB, and perp. $DC = DO$ make the right angled triangle DCB; then parallel to CB draw the tangents LQMG, HRKF, and the thing is done.

Demon. Produce DC both ways, and draw FBG parallel to it. From the equals DN, DT take the equals DC, DO and CQ (BG), VT, and there remains $QN = OV$; alſo by taking the equals QN, OV from the equals NP, AV, there remains $QP = AO$; and from QP, AO taking QR (FG), AI, there remains $RP = IO$; and conſeq. $OE = NR$. Whence, by conſtr. and the property of the circle, $OI . OE$ or $RP . RN$ or $RH^2 : OA . OV$ or $PQ . QN$ or $LQ^2 :: m^2 : n^2$, or $HK : LM :: m : n$.

The ſame anſwered by Mr. John Knowles.



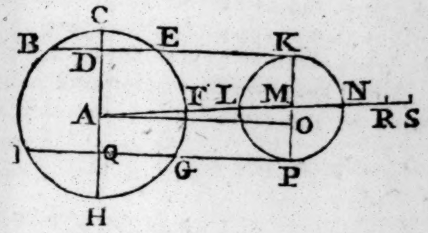
Conſtr. In the indefinite line FG make $AB =$ the diameter of the leſs circle; and take $FA : FB$ and $CA : CB$ as $m : n$, each in the given ratio of the chords; alſo by Simp. Geom. V 18 add CS to CF ſo that $FS . SC$ may be = the ſquare of the radius of the greater circle; with which radius, and center S, deſcribe that circle, cutting the perp. AE in E; draw FE to cut the circle again in D; join DB; and AE, BD ſhall be the ſemichords required.

Demonſtr. Join C and E, C and D, S and E, S and D. Then by conſtr. $SF : SE :: SE : SC$, and the ∠ at S common, theref. the triangles SFE, SEC are equiangular, or $\angle SEF = SCE$, and their ſup. $FCE = SED = SDE$ becauſe $SD = SE$. Then becauſe $\angle FCE = FDS$ (SDE), and ∠ F common, the △s FCE, FDS are equiangular, conſeq. $FC : FE :: FD : FS$, or $FD . FE = FS . FC = FS . \overline{FS - SC} = FS^2 - FS . SC$. But by the nature of the circle $FD . FE = FG . FI = FS^2 - SE^2$. Theref. $SE^2 = FS . SC$ as by conſtr.

Again, by conſtr. $FS : SD :: SD : SC$, and the ∠ S common, theref. the △s FSD, CSD are equiangular, and the $\angle SCD = SDF = FCE$ from above. Theref. the △s CAE, CbD are equiangular, having $SCD = FCE$, and ∠s A and b right;

and therefore CA : Cb : : AE : bD : : FA : Fb;
but by conſtr. CA : CB : : - - - - - FA : FB;
therf. FB : BC : : Fb : bC, and by div. FC : CB : : FC : Cb. Conſeq. b coincides with B, BD ∥ AE, and AE : BD : : CA : CB, the given ratio by conſtr.

The ſame by Mr. John Brinkley.

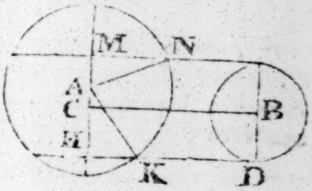


Draw AFLMN through the centers A and M of the given circles, producing it to R ſo that LR : LN : : $m^2 + n^2 : m^2 - n^2$ ($m : n$ being the given ratio), and again producing it (by Simp. Geom. V 18) to S ſo that LS . SR = $AF^2 - LM^2$; then on AM as hypothenuſe and MO = RS, make the right-angled △ AMO. Produce MO to the circumf. at K and P, and perp. KP draw BDEK and IQGP; then BE and IG are the chords required.

For perp. BE and IG draw the diam. CDAQH. Now by conſtr. $AF^2 - LM^2 = LS.SR = LR.RS + RS^2$; or, taking away RS^2 from each, $AF^2 - LM^2 - RS^2 = LR.RS : LN.RS : : m^2 + n^2 : m^2 - n^2$ by conſtruction. But $QG^2 + DE^2 = 2AF^2 - AD^2 + AQ^2$ ($= KO^2 + OP^2 = 2KM^2 + 2OM^2 = 2LM^2 + 2RS^2$) $= 2AF^2 - 2LM^2 - 2RS^2$, alſo $QG^2 - DE^2 = AD^2 - AQ^2 = 2LN.RS$. Hence by expoſition $QG^2 + DE^2 : QG^2 - DE^2 : : m^2 + n^2 : m^2 - n^2$; theref. by comp. and div. $QG^2 : DE^2 : : m^2 : n^2$, or IG : BE : : $m : n$.

Ingenious geometrical anſwers were alſo given by Meſſrs. *Amicus*, *Beck*, *Clarke*, *Cockerbill*, *Fletcher*, *French*, *Parnel*, *Sanderſon*, *Treleaſe*, and *Whitton*.

The ſame algebraically, by Mr. Thomas Robinſon.



Put b = greater radius AN, c = the leſs BD or CH or CM, and x = AC. Then AH = $c + x$, AM = $c - x$, $MN^2 = b^2 - \overline{c - x}|^2$, and $HK^2 = b^2 - \overline{c + x}|^2$. Hence per queſt. $b^2 - \overline{c - x}|^2 : b^2 - \overline{c + x}|^2 : : m^2 : n^2$, and hence

$$x^2 + \frac{m^2 + n^2}{m^2 - n^2} \cdot 2cx = b^2 - c^2.$$

Algebraic ſolutions were alſo given by Meſſrs. *Adams*, *Dalton*, *Rowe*, *Terril*, *Williams*, *White*, *Wood*, and *Young*.

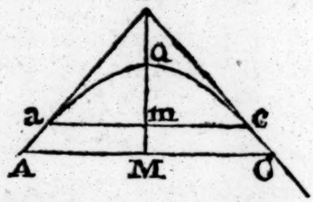
XII. Queſtion 814 anſwered by Plus Minus.

LET fall a perp. OV from the eye to the plane of the draught, which call d; from the point V where it meets that plane (which is called the point of view) let fall a perp. VA to the fundamental line (or line of interſection of the two planes mentioned in the queſtion), which call a. Then find an equation for the given conic ſection, having the vertex of the abſciſſa (z) in that point A, and the abſciſſa itſelf extended along the fundamental line; this done, ſubſtitute $\frac{ax}{a-y}$ for z, and $\frac{dy}{a-y}$ for v (the perp. ordinate of the given conic ſection) and the reſulting equation will be that of the perſpective appearance required, the abſciſſa and its vertex being common to both curves and the ordinates perp. to the abſciſſas.

Cor. The perſpective appearance of any algebraic curve will always be a curve of the ſame order; for the ſubſtitution of $\frac{ax}{a-y}$ for z, and of $\frac{dy}{a-y}$ for v $\left\{\begin{array}{l}\text{cannot raiſe the equation to a higher}\\ \text{degree, or depreſs it to a lower.}\end{array}\right.$

The ſame anſwered by Amicus.

It is known that the repreſentation of a conic ſection on a plane, is alſo a conic ſection; the demonſtration being the ſame as that for the geneſis of curves by ſhadows. Therefore find the repreſentation of five points of the given curve, and through them as directed by writers on conics deſcribe a conic ſection, and it will be the repreſentation required. Or, otherwiſe, let AC be the repreſentation of an ordinate parallel to the plane of the picture, a c another; on the line B m M that biſects them find the repreſentation of a point Q in the curve, and deſcribe the ſection A a Q c C.—Or, let AB, BC be the repreſentation of two tangents to the firſt-named ordinate, which conſequently are tangents to the repreſentation; biſect A C in M, join B M, and in it let Q be the point that is immediately between the eye and the object; through the vertex Q and points of contact A C deſcribe the ſection as directed by writers on conics, and it will be the repreſentation required.



It is with much regret that our narrow limits oblige us to omit the other very compleat and ingenious ſolutions by Meſſrs. *Beck*, *Clarke*, and *French*. It was alſo anſwered by Meſſrs. *Knowles*, *Rowe*, *Terril*, and *Treleaſe*.

XIII. Queſtion 815 anſwered by Amicus.

PUTTING the tangent $x^{\frac{1}{2}n} = z$, and dividing both ſides of the equa. by x^{1-n}, the finite ſide becomes $\frac{ax^{\frac{1}{2}n}+1}{\sqrt{1+x^n}} - 1 = \frac{az+1}{\sqrt{1+z^2}} - 1$ and the infinite ſide thrown into fluxions will evidently be the product of the two following ſeries, viz. $z - \frac{z^3}{3} + \frac{z^5}{5} - \frac{z^7}{7}$ &c. and $\dot{z} \times : 1 - \frac{3z^2}{2} + \frac{3 \cdot 5 z^4}{2 \cdot 4} - \frac{3 \cdot 5 \cdot 7 z^6}{2 \cdot 4 \cdot 6}$ &c. $= a\dot{z} \times \overline{1+z^2}\,)^{-\frac{3}{2}}$ = the arc a × flux. of its ſine $\frac{z}{\sqrt{1+z^2}}$;

the fluent by Simp. Flux. Art. 342, corrected to be $= 0$, when $z = 0$, is - - - - $\Big\} \frac{az+1}{\sqrt{1+z^2}} - 1$ which is the very expreſſion above, as required to be inveſtigated.

Note. When $z = 1$, the ſum of the ſeries is $= \frac{a+1-\sqrt{2}}{\sqrt{2}}$.

The ſame anſwered by Mr. George Sanderſon.

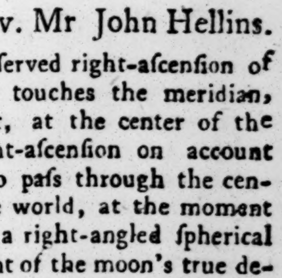
Put S for the ſum of the infinite ſeries, and multiply the whole by $x^{\frac{1}{2}n-1}$, then $\frac{1}{2}x^{\frac{1}{2}n} - \overline{\frac{3}{2.4} + \frac{1}{3.4}} . x^{\frac{3}{2}n} + \overline{\frac{3.5}{2.4.6} + \frac{3}{3.2.6} + \frac{1}{5.6}} . x^{\frac{5}{2}n}$ &c. $= S x^{\frac{1}{2}n-1} = \frac{a}{\sqrt{1+x^n}} + \frac{1}{x^{\frac{1}{2}n}} \sqrt{\frac{1}{1+x^n}} - \frac{1}{x^{\frac{1}{2}n}}$ (by N° 327 pa. 23, Clarke's Supp. to Lorgna's Series, x there being $= x^{\frac{1}{2}n}$ here, and is the tangent of an arc expreſſed by a), which is equal to $\frac{a + x^{-\frac{1}{2}n}}{\sqrt{1+x^n}} - x^{-\frac{1}{2}n}$. Divide by $x^{\frac{1}{2}n-1}$ then $S = \frac{a x^{1-\frac{1}{2}n} + x^{1-n},}{\sqrt{1+x^n}} - x^{1-n}$, as was to be inveſtigated.

This queſtion was alſo anſwered by Meſſrs. *Clarke*, *Fletcher*, *French*, *Knowles*, and *Whitton*.

XIV. Queſtion 816 anſwered by the Rev. Mr John Hellins.

It is well known to aſtronomers, that the obſerved right-aſcenſion of the limb of the moon, where that limb touches the meridian, is the ſame as would be ſeen, at that moment, at the center of the earth. Now to find the correction of right-aſcenſion on account of the moon's ſemi-diameter, conceive a plane to paſs through the centers of the earth and moon, and the poles of the world, at the moment the moon's limb touches the meridian; then in a right-angled ſpherical triangle will be given the baſe = the complement of the moon's true declination, the perpendicular = the moon's ſemidiameter as ſeen from the center of the earth, to find the angle at the baſe; which is to be added to, or ſubſtracted from, the right aſc. of the limb, according as the weſtern or eaſtern limb was obſerved. And ſince the perp. of the given triangle is always = the angle which the moon's ſemidiameter ſubtends at the earth's center, it is evident that the *horizontal diameter pro tempore* is to be uſed.

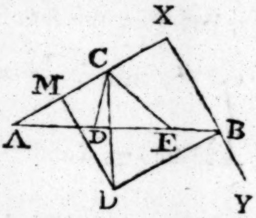
The ſame anſwered by Mr. George. Sanderſon.



Let PZNnH repreſent the meridian, ZMmK a vertical circle paſſing through the moon's center, P the pole, Z the zenith. If n be the apparent place of the point in the moon's limb touching the meridian, and m that of her center in the vertical circle ZmK; then becauſe the parallax does not alter the true vertical poſition of an object, their true places N and M will be in the ſame verticals, but nearer the zenith (ſee la Caille's Aſtron. art. 405 and cors.); therefore N M is the true ſemidiameter as ſeen from the earth's center, and its right-aſc. is expreſſed by the ∠NPM, being leſs than the ∠nPm, which is the right-aſc. increaſed, on account of her parallax. Whence it is manifeſt, that the right aſc. muſt be deduced from the true ſemidiameter N M.

True anſwers were alſo ſent by Meſſrs. *Amicus*, *Clarke*, and *Knowles*.

XV. (or Prize) Queſtion 817 anſwered by Amicus.



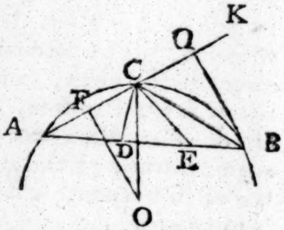
PRODUCE the given ſide AC to X till $2AX.AC = AC^2 + AE^2$; through A and C to touch the indef. perp. XY in B deſcribe a circle ABC; join AB, CB, and ACB is the required triangle.

For make AE = the other given line, draw CE, and CD ⊥ AB. Then the angles at D and X being right, the points C, D, B, X are in a circle, and $2AX.AC = 2AD.AB$, but it is by conſtr. $= AC^2 + AE^2$, which by Eucl. II 13 is $= CE^2 + 2AD.AE$, conſeq. this $= 2AD.AB$, take away $2AD.AE$ common, and $CE^2 = 2AD.EB$; and ſince this holds at every point of the perp. XY as well as at that where the circle drawn through A and C touches it, that perp. is the locus of all points B ſuch that $2AD.EB = CE^2$; and ſince the circle ABC that touches it is leſs than any that cuts it, the angle ABC is the greateſt poſſible.

Computation. AC being biſected in M, $MO \parallel XY$, ſince the circle touches at B, $OB = OC = MX$, and by conſtr $2AX.AC = 208$, theref. $AX = 13$, $13 - 4 = 9 = MX = CO$, $MO = \sqrt{65} = BX$, $\frac{1}{2}AC.BX = 4\sqrt{65}$ = the area of the △ABC = 32·249028, and $AB = \sqrt{:AX^2 + XB^2} = 3\sqrt{26} = 15{\cdot}29705$.

Cor. If the ∠ABC be given, a ſegm. deſcribed on AC to contain it, will give B.

The ſame by Mr. George Sanderſon.



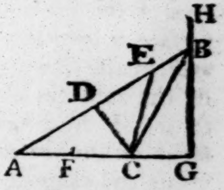
Conſtr. On the indefinite line AK take AC = the given ſide = 8, and AQ ſuch that $2AC.AQ = AC^2 + AE^2$, biſect AC in F, and having erected the indef. perp. FO apply AO = FQ, and compleat the rectangle OFQB. Draw AB, on which take AE = 12, join CE and CB, let fall the ⊥ CD, and the thing is done.

Demonſt. The △s ACD, ABQ are ſim. theref. $AD.AB\ (AD.AE + EB) = AC.AQ$, whence $2AD.AE + 2AD \cdot EB = 2AC.AQ = AC^2 + AE^2$ by conſtr. but $AC^2 + AE^2 - 2AD.AE = CE^2$ (Eucl. II. 13), theref. $2AD.AE + 2AD.EB - 2AD.AE = 2AD.EB = CE^2$. Now BQ is the locus of the point B (∠ABC), and FOBQ is a rectangle whoſe ſide OB = OA (= FQ), and FO biſects AC by conſtr. theref. the circle with OA radius paſſes through the points A, C, B, and touches QB in B, whence it is well known that the ∠ ABC is greater than any other that can be made by lines drawn from A and C to meet in BQ, theref. the ∠ ABC is a maximum.

Calcul. $AQ = \overline{AE^2 + AC^2} \div 2AC = 13$, theref. $AO = FQ = 9$, and $QB = FO = \sqrt{\overline{AO^2 - AF^2}} = 8{\cdot}06$, and $AB = \sqrt{\overline{AQ^2 + QB^2}} = 15{\cdot}297$; whence by ſim. △s, $CD = 4.216$, $AD = 6{\cdot}798$, $DE = 5{\cdot}202$, $EB = 3{\cdot}297$; and the area of the △ ABC $= 32{\cdot}249$, and the ∠ ABC $= 26° \, 23' \, 16''$.

Note, If AC be greater than AE, then Q falls between A and C, in which caſe the ∠ ABC muſt be a given quantity, as there can be no maximum.

The ſame by Mr. Reuben Robbins, Teacher of Mathematicks.



CONSTR. Biſect the given ſide AC in F, and produce AC till FG be a 3d propor. to 2 AC and the given diſt. AE; in the indef. perp. GH take GB a mean propor. between AG and GC; join AB and BC; and in AB take AE of the given length, alſo let fáll the ⊥ CD. Then is ABC the required triangle, and D, E the two gates.

Demon. AC is = the giveu ſide by conſtr. and BG being a mean between AG and GC, theref. GH will (by III 22. Simp. Geom.) be a tangent to a circle paſſing through A, B, C, and the ∠ ABC a max. (by Simp. Alg. pr. 44, page 358). Again AE^2 being (by conſtr.) $= 2AC \, . \, FG = 2FG \, . \, AC = AG^2 - CG^2 = AB^2 - BC^2$ (by Simp. Geom. II. 9, and cor. 2), therefore (by Simp. Geom. II. 10), $2AD \, . \, AB = AC^2 + AB^2 - BC^2 = AC^2 + AE^2$, and (by the ſame) $2AD \, . \, AE = \text{- - - - - - -} \; AC^2 + AE^2 - CE^2$; theref. by ſubſtr. $2AD \, . \, EB = CE^2$, as required.

Calcul. $FG = AE^2 \div 2AC = 9$, $AG = FG + AF = 13$, $CG = FG - FC = 5$, $BG = \sqrt{\overline{AG \, . \, GC}} = \sqrt{65} = 8{\cdot}062258$, $AB = \sqrt{\overline{AG^2 + BG^2}} = 15{\cdot}297058$, $BC = \sqrt{\overline{CG^2 + BG^2}} = 9{\cdot}486832$, $AD = AG \, . \, AC \div AB = 6{\cdot}798692$.

And nearly on the ſame principle was the ſolution given by Meſſrs. *Beck*, *Bewly*, *Bonnycaſtle*, *Bownas*, *Clarke*, *Cockerhill*, *Dixon*, *Edwards*, *Fletcher*, *French*, *Hampſhire*, *Knowles*, *Nauticus Secundus*, *Parnel*, and *Treleaſe*.

An Algebraic ſolution by Mr. Robert Abbatt.

Put $AC = a = 8$, $AE = b = 12$, $AD = x$, $DB = y$; then $DE = b - x$, $EB = x + y - b$, and $CD = \sqrt{\overline{a^2 - x^2}}$, and $CE = \sqrt{\overline{a^2 + b^2 - 2bx}} = \sqrt{\overline{c^2 - 2bx}}$, by making $c^2 = a^2 + b^2 = 208$. Hence per queſt. $2x \times \overline{x + y - b} = c^2 - 2bx$. And by trigon. $DB : DC :: 1 \text{ (rad.)} : \dfrac{\sqrt{\overline{a^2 - x^2}}}{y} \left\{ \begin{array}{l} = \text{tang. } \angle \text{ B a max.} \\ \text{From 1ſt equa. } y = \end{array} \right.$

$\frac{c^2 - 2x^2}{2x}$, $\left\{ \text{which value ſubſtituted in the max. gives} \right\}$ $\frac{2x\sqrt{a^2 - x^2}}{c^2 - 2x^2}$ $\left\{ \text{the flux of which made} = \right.$ 0, gives $x = \frac{ac}{b}\sqrt{\frac{1}{2}} = \frac{2}{3}\sqrt{104} = 6{\cdot}798692 = AD$. Therefore $y = 8{\cdot}498366 = DB$, $EB = 3{\cdot}297058$, $CD = 4{\cdot}21637$, $AB = 15{\cdot}297058$, $CE = 6{\cdot}695622$, tang. $\angle B = {\cdot}4961389$ anſwering to $26^\circ\ 23'\ 16''$, and the area of the triangle $= 3ac$. or . 35·98 p. .

Algebraic ſolutions were alſo given by Meſſrs. *Bennett*, *Dees*, *Dowden*, *Hellins*, *Nicholſon*, *Robinſon*, *Rowe*, *Terril*, and *Young*.

The QUERY anſwered by Terricola.

The aperture and focal diſtance of the burning glaſs being given, the denſity of the ſun's light in its focus at different diſtances from the ſun, will be as the denſity on the ſurface of the burning glaſs directly, and the area of the ſun's image in the focus inverſely. But the denſity on the ſurface is inverſely as the ſquare of the diſtance from the ſun; and the area of the ſun's image is as the ſquare of its diameter, or as the ſquare of the apparent diameter of the ſun at the place, or inverſely as the ſquare of the diſtance from the ſun: therefore the denſity of the ſun's light on the ſurface of the glaſs, and the area of the ſun's image, increaſe and decreaſe in the ſame ratio, viz. inverſely as the ſquare of the diſtance from the ſun; and conſequently the denſity of the light at the focus will be a given quantity at all diſtances, the ſame at Saturn, the Earth, and Mercury, as at any other planet.

NEW QUESTIONS.

I. QUESTION 818 by Mr. William Purver.

OLD Joan, a mark of envious time,
Long paſt the period of her prime;
Yet for a beauty ſtill would paſs,
And oft conſults her looking-glaſs;
Her ſilver locks play on her neck,
Vermilion gives a bluſhing cheek.
But judge, Diarians, from below,
How vain is ſuch external ſhow.
Ingenious artiſts, pray produce
A better mirror for her uſe;
As other mirrors can't maintain
Convincing proofs that ſhe is vain,

$$\left.\begin{aligned} x^2 + 2xy + y^3 &= 238840 \\ x^3 + xy^2 + y^4 &= 14791776 \end{aligned}\right\}$$ To find $x =$ her height in feet, and $y =$ her age in years.

II. QUESTION 819 by Mr. Richard Tattam, jun.

GIVEN the four ſides of a billiard table ABDC, namely the length 10, and the breadth 6 feet; a ball in P being ſtruck, touched the ſides AB in Q, BD in R, DC in S, and went into the pocket A, the diſtance of A from S being 10 feet. Required the leaſt diſtance of P from the pocket A.

III. QUESTION 820 by Mr. John Brinkley.

GIVEN the baſe, the ſum of the ſquares of the other two ſides, and the rectangle of the ſegments of one of thoſe ſides made by a perpendicular falling from the oppoſite angle, to determine the triangle.

IV. QUESTION 821 by the Rev. Mr. John Hellins.

If the ſurſolid equation $x^5 + qx^3 - rx^2 - t = 0$ has two roots equal to each other, then ſhall one of them be a root of this quadratic, $x^2 + \frac{2qq}{5r}x + \frac{5t}{3r} - \frac{4q}{15} = 0$. Query the demonſtration.

V. QUESTION 822 by Mr. Reuben Robbins.

GIVEN the difference of the ſides, the difference of the angles at the baſe, and the line biſecting the vertical angle, to determine the triangle.

VI. QUESTION 823 by Mr. C. Cockerhill.

AB and BC are two right lines perpendicular to each other: now ſuppoſe a body to move from A along AB, and that its velocity at any point P is inverſely as the right line PC; in what time after its firſt ſetting out will it arrive at B, ſuppoſing its velocity at the commencement of motion to be one foot per ſecond, AB equal 100 yards, and BC equal 150 yards.

VII. QUESTION 824 by Mr. Nathan Parnel.

GIVEN the magnitude and poſition of two circles; to draw a chord CD of the greater, to touch the leſs at T, ſo that CT and TD ſhall have a given ratio.

VIII. QUESTION 825 by Mr. Iſaac Dalby.

TO determine how the latitude and variation of the needle can be found, by obſerving two azimuths of the ſame known fixed ſtar with the azimuth compaſs.

IX. QUESTION 826 by Atticus.

IN every triangle, the interſection of the perpendiculars let fall from the angular points on the oppoſite ſides, the center of gravity of the triangle, and the center of the circumſcribed circle, are all in the ſame ſtraight line; and the diſtances of thoſe points from one another, are in a given ratio.

X. QUESTION 827 by Mr. George Beck.

A youth unſkill'd in ancient lore,
Who ne'er was ſmit with love before,
Is now involv'd in deep diſtreſs;
He loves a fair young Platoneſs *.
Her ſnowy neck and beaming eye,
The powers of mimic art deſy;
Who would not learn geometry!

To find what ſkill her ardent love has,
She gives this problem to the novice:
"Turn down a page i'th'Almanac,
The corner doubling to the back,
The creaſe muſt be a minima;
But mind you uſe no algebra:
Ye fair who ſolve each arduous prize,
Aſſiſt us now, or Strephon dies.

* Alluding to the famous motto ȣδεὶς αγεωμ, &c. which Plato ſet over the door of his academy.

We are glad to find this ingenious gentleman is preparing for the preſs, a Treatiſe on Surveying, Planning, Perſpective, &c. containing the deſcription and application of his new Apparatus for thoſe purpoſes.

XI. Question 828 by Mr. John Bonnycaſtle.

IT is required to give a geometrical demonſtration of the common rule for finding the area of a trapezium inſcribed in a circle, from the four ſides being given, as the demonſtrations that I have hitherto ſeen cannot be called geometrical.

XII. Question 829 by Plus Minus.

HOW many ways is it poſſible to lay a pavement (that is, to complete a ſpace round a point) with regular polygons?

XIII. Question 830 by Mr. George Sanderſon.

GIVEN the vertical angle, and the ſum of the baſe and perpendicular, to conſtruct the triangle when the ſum or difference of the ſides is a maximum.

XIV. Question 831 by Mr. Iſaac Dalby.

HAVING four right lines given in poſition; to find a point from which if four other right lines are drawn to meet the former in given angles, the ſum of two of them, and the rectangle of the other two, may be reſpectively given: A geometrical conſtruction is required.

The above is prob. 12 Newton's Arith. edit. 1720. Or prob. 23 of the later editions.

XV. (or Prize) Question 832 by Amicus.

IF two bodies A and B, connected by a ſtring or otherwiſe, at the ſame invariable diſtance from each other, move, the one A along a given right line with a given uniform celerity, the other B ſo, that its velocity in the direction of the connecting line AB, may always be equal to that in a direction perpendicular to it. I demand the aſymptote, equation, quadrature, and rectification of the path of B, its center of curvature, and the quadrature of the path of that center.

⁂ The prizes have been determined by lot as follows: Firſt, for the prize queſtion, to Mr. John Hampſhire 12, and to Mr. Caleb Cockerhill 8 diaries.—2dly, prize enig. to Hebe 12, and the Highland Laddie 8 diaries.—3dly, for all the enigmas, to the Rev. Mr. T. Baker 10, and Amintor 10.—4thly, Queries, &c. to Calophilus 8, and to Mr. Thomas Eland 8 All of whom will pleaſe to ſend for them to Mr. Wilkie, at Stationer's Hall, London.——N. B. All other letters for the uſe of the Diary muſt be directed thus, "For the Ladies' Diary, Stationers-Hall, London."

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